

 News & Notes
Tech & Business News

 Business Tech
Disaster Recovery

 Personal Tech
Find It Online

THE ULTIMATE PROTECTION FOR YOUR PC

Kaspersky PURE 3.0 TOTAL SECURITY

Safeguard Your System From:

- ✓ Spam
- ✓ Viruses
- ✓ Exploits
- ✓ Phishing
- ✓ Rootkits
- ✓ Spyware
- ✓ Malware
- ✓ Cyber Criminals
- ✓ Network Attacks
- ✓ Stolen Passwords
- ✓ Security Breaches
- ...And More!



On The Cover

Kaspersky PURE 3.0

The latest offering from Kaspersky safeguards your system from viruses, spyware, rootkits, network attacks, and more.



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Tech Focus

18 | Monitors

Display technology has changed drastically since you got that first computer. The big, bulky, heavy CRT monitor has been replaced by wafer-thin, ultra-light LED, LCD, and plasma displays capable of astonishing super-high resolution that can be used not just for computer output, but also for HD movies and video. We'll take you on a tour of today's hi-def display tech.



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Technology News

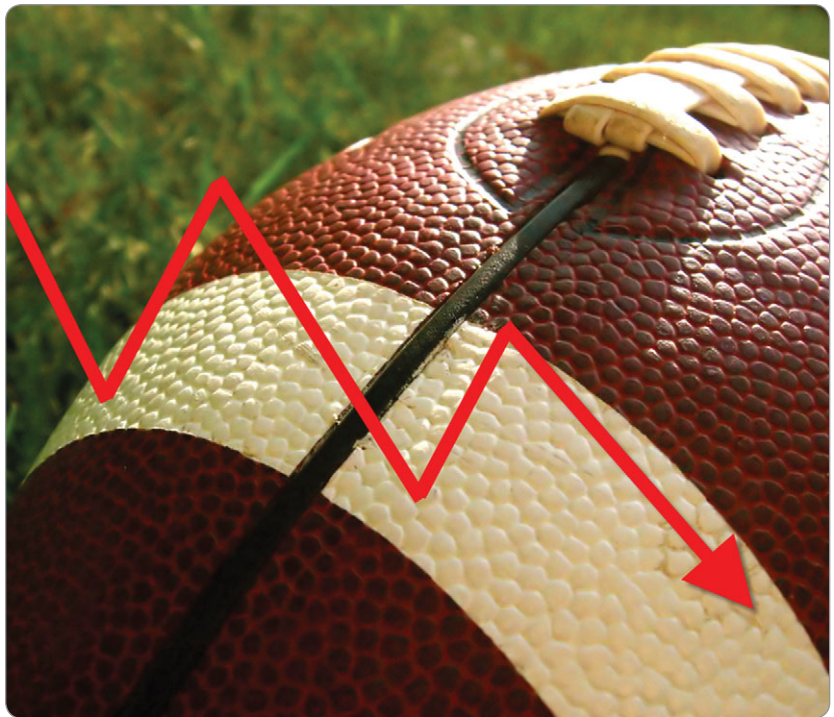


THE SOCIAL NETWORKING TIME SINK

According to a survey of over 18,000 people from Ipsos Open Thinking Exchange, the average respondent spends an average of 3.6 hours a day using social networks. Respondents 35 and younger said they spend 4.2 hours a day on social networking activities. Older generations spend slightly less time; 35-49 year olds spend an average of 3.1 hours and those 50 and older spend an average of 2.8 hours a day on social networks.

THE SUPER BOWL STREAMING SLUMP

According to a new blog post from the communications service provider Sandvine, the Super Bowl was once again available to fixed access U.S. broadband subscribers via streaming, but total traffic for the big game was down 15% compared to an average Sunday. The post points out that the drop in Web traffic, which Sandvine dubs the "Super Dip," occurs because people would rather watch the Super Bowl on their largest screen, the TV, than on a smaller PC, notebook, or tablet screen. To give you an idea how much of an impact the Super Bowl had on Web traffic, Sandvine claims that the game accounted for 3% of the night's total Web traffic.



LOTS OF LOVE FOR E-CARDS

A recent Harris Interactive study, commissioned by the cloud and mobile testing firm SOASTA, found that e-Card providers like Hallmark were probably slammed on Valentine's Day. The survey found that 38% of Americans said they would visit an e-Card site to transmit their sentiments electronically. Almost half (47%) of all men 35 to 44, 41% of men 18 to 34, and 41% of women 18 to 34 said they intended to send e-Cards for Valentine's Day. Things e-Card recipients didn't want to see in their holiday cards included "Not Safe For Work" images (29%), unicorns (25%), pictures of the sender's kids (24%), pictures of the sender's spouse (23%), and kittens (19%).



More than 90% of tablet owners use their devices at home.

TABLETS AREN'T MOBILE

According to comScore, tablets only classify as mobile devices in that people can easily move them from room to room. According to the analyst firm, more than 90% of tablet owners use their devices at home, less than 40% use them in public, and less than 30% use them at work. Just 15% of the survey respondents use their tablets in other locations.



● You might be seeing prompts like this more often.

ONE LOGIN TO RULE THEM ALL

Get ready: You may be seeing websites and apps asking you to log in with Facebook a lot more often. According to Gartner, by the end of 2015, one of every two new retail customer identities will be based on social network logins. The trend isn't surprising; using a social network login to access other products and services can be convenient, but users need to understand that the added exposure can be a security risk. If you find yourself frequently logging into third-party services using a social network identity, then make sure your social network password and username are long, random, and hard to crack.



● We're getting used to the idea that one's office can be anywhere—or everywhere or nowhere. But it looks like the traditional office will be around for a while.

THE FUTURE OFFICE

A recent Harris Interactive survey commissioned by imaging product producer Ricoh attempts to predict what the office of the future will look like. According to the survey, 64% of Americans would prefer to work virtually, but 53% agree that today's traditional office will survive for at least another half-century. Those who favor a traditional office environment cite the social connectedness and information security that they enjoy in a traditional office environment. The best reason to stay in the office? 66% said that they would be more disciplined and productive in an office compared to working at home.

Windows News



- Surface Pro tablets feature a built-in kickstand.

REMOTE FILE ACCESS

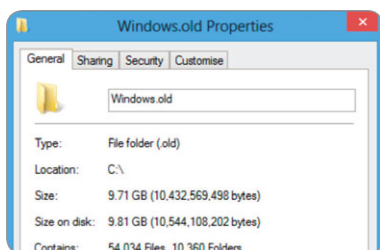
Microsoft Office 365 Home Premium features a cloud service that allows you to access your documents, spreadsheets, email, and presentations from any device with an Internet connection. Office 365 Home Premium supports up to five devices, including Windows tablets, PCs, and Macs—all of which can share access to the files you store in the cloud. You can also package an extra 20GB of SkyDrive storage and 60 free Skype minutes per month as optional add-ons. Office 365 Home Premium includes Word, Excel, PowerPoint, OneNote, Outlook, Publisher, and Access.

SURFACE PRO TAKES TABLETS TO A NEW LEVEL

With the Surface Pro family of computers, Microsoft has channeled the capabilities of a traditional PC into a tablet, as Surface Pro can run Windows 8 Pro. You'll also enjoy improved performance over Microsoft's Surface tablet lineup, because the Pro tablets are built with an Intel processor that provides impressive multitasking power and built-in support for HD graphics. The Surface Pro is available with either 128GB or 64GB of built-in memory. For additional storage, you'll find a microSDXC card slot that supports up to 64GB cards. A mini DisplayPort will allow you to clone your display onto a monitor or HDTV. Support for accessories and peripherals, such as a printer or mouse, is provided via the full-sized USB port, while Bluetooth 4.0 and Wi-Fi allow for wireless connectivity.

● THE NEW OFFICE

Microsoft's Office 365 Home Premium offers built-in cloud storage for access on multiple devices.



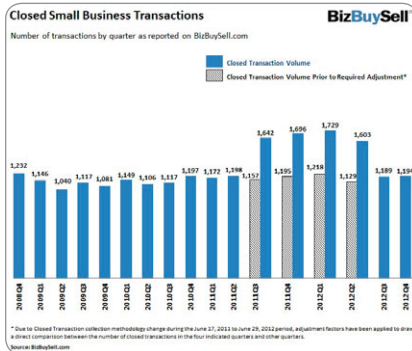
- The Windows.old folder may be taking up a lot of storage space on your PC.

GAIN STORAGE CAPACITY AFTER AN UPGRADE TO WIN8

If you choose to upgrade from Windows 7 to Windows 8 without formatting the hard drive, Win8 will move many files found in the previous Win7 installation into a folder, titled Windows.old, from which you can recover old data. Typically, the contents include Win7 Documents, Music, Pictures and Videos folders; old settings; and Program Files folders. Unfortunately, this folder generally takes up at least 15GB of disk space. We recommend that you transfer files you may need and delete others to free up disk space. To perform the latter, run Disk Cleanup by searching the Charms bar for "Disk Cleanup." Click Settings and choose Free Up Disk Space By Deleting Unnecessary Files. Click the Clean Up System Files button and select the checkbox next to Previous Windows Installation(s). Press OK and run Disk Cleanup.



Business News



● BizBuySell.com tracks the sale of small businesses.

END OF 2012 WAS BETTER THAN 2011 FOR SMALL BUSINESSES

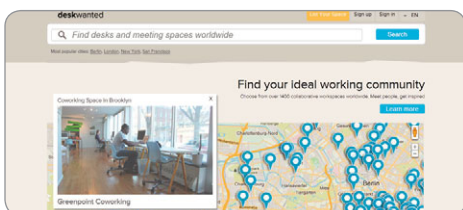
BizBuySell.com released results from its Q4 2012 Insights Report that found a 43.4% increase, compared to 2011, in business-for-sale activity during the final three weeks of December. The torrid pace brought total transaction activity to nearly the same year-over-year, as it was up 0.2% versus 2011. Experts from BizBuySell attributed the end of the year increase to government's changes to tax policy on businesses owners, as well as fear of the "fiscal cliff." The median cash flow of businesses for sale in 2012 rose to \$88,902, which was a 4.6% increase over the \$85,000 mark set in 2011. As small businesses grew during 2012, their median asking price increased.

CO-WORK IN THE BROOKLYN PUBLIC LIBRARY

Within the Brooklyn Public Library, you can venture to the Shelby White and Leon Levy Information Commons to find workspaces with public meeting rooms and a training lab. In total, the open workspace provides seating for 70 laptop users, and you'll find 25 computer workstations already in place. There are even 10 iMacs that feature digital imaging and video editing software. Seven meeting rooms are available and can be reserved for groups of at least two people. Inside the meeting rooms, you'll find a flatscreen that can be easily connected to a laptop for presentations and video conferences. The largest meeting room includes a SMART Board. Those interested in creating podcasts, videos, and other video projects should look to book meeting room #1, as it can serve as a recording studio. Finally, the training lab provides up to 36 seats, ideal for classes, workshops, and collaborative work.



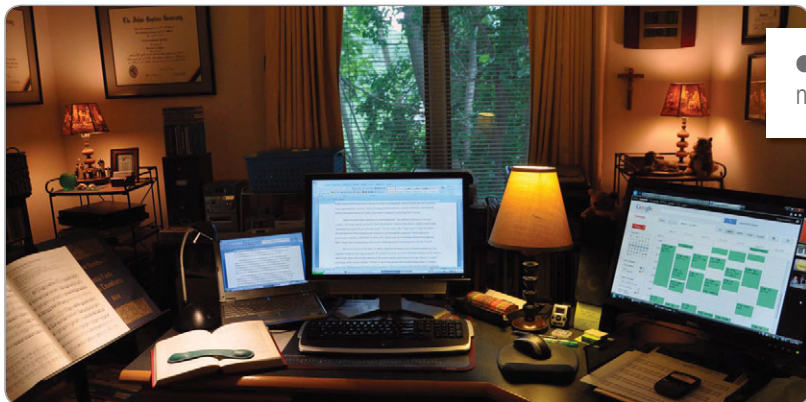
● **NEW CO-WORKING AREA**
Check out the new Shelby White and Leon Levy Information Commons in the Brooklyn Public Library.



● Deskwanted requires all booking requests to be checked and accepted within 24 hours.

DESKWANTED

This website (www.deskwanted.com) lists more than 1,400 collaborative workspaces, including coworking locations and private shared offices. Coworkers can also use Deskwanted to book a desk or meeting room in advance using instant booking. You'll just need to pay a 15% deposit/downpayment when you book, and the remaining rental fee will be due when you arrive at the workspace. All daily and hourly desk plans can be instantly booked, and some spaces may also offer weekly and monthly desk plans through Deskwanted.



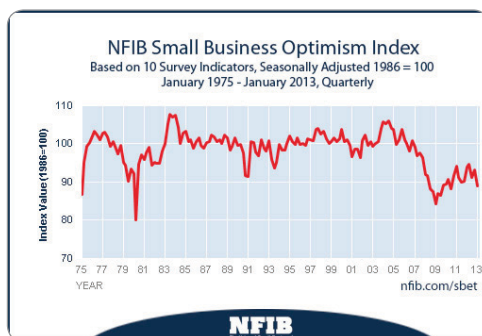
● Home office tax deductions are now much easier to calculate.

HOME OFFICE TAX DEDUCTIONS

The IRS announced some changes for calculating home office tax deductions in an effort to simplify the process. Rather than using the current 43 line form, which includes many provisions, you'll be able to deduct \$5 per square foot of home office space—up to a maximum of 300 square feet. As such, you'll be able to claim up to \$1,500 in deductions. The IRS expects that taxpayers will save up to 1.6 million hours per year in tax preparation, thanks to the new process. We'll also note that the tax deduction changes are part of a complete effort by the President's Office of Information and Regulatory Affairs to reduce paperwork for small business owners, so check on other government agency updates.

SMALL BUSINESS CONFIDENCE RISES SLIGHTLY AFTER "FISCAL CLIFF" SCARE

The Small Business Optimism Index from the NFIB (National Federation of Independent Business) gained 0.9 points, increasing to 88.9, after a big drop in December. The gains didn't reclaim the losses from the "fiscal cliff" scare, but NFIB did note that expectations for better business conditions did improve by five points, up to a net negative of 30%. The report found that job creation for small businesses was slightly up in January, as 11% of those surveyed added employees over the past few months. Only 9% reduced employment (seasonally adjusted), down four points from the previous quarter. Capital spending was still categorized in "maintenance mode," but there were small increases.



● Overall, the Small Business Optimism Index is still near historic lows.

Small business events give you a chance to learn critical management skills and network with professionals in related fields. Don't miss these upcoming opportunities. If you would like to see your event here, email editor@smartcomputing.com with the subject Small Business Event.

HUBZONE SMALL BUSINESS SUMMIT

Dallas, TX | April 17, 2013
www.hubzonecouncil.com

BUSINESS EXPO & SMALL BUSINESS CONFERENCE

Madison, WI | April 23, 2013
<http://greatermadisonchamber.com>

AMERICA'S SMALL BUSINESS SUMMIT 2013

Washington, DC |
April 29th- May 1st, 2013
<http://www.uschambersummit.com>

VENDOR OUTREACH SESSION

Washington, DC | May 14, 2013
www.hhs.gov/about/smallbusiness/events.html

VETERAN ENTREPRENEUR TRAINING SYMPOSIUM

Reno, NV | June 10th-13th, 2013
www.veterantrainingsymposium.com

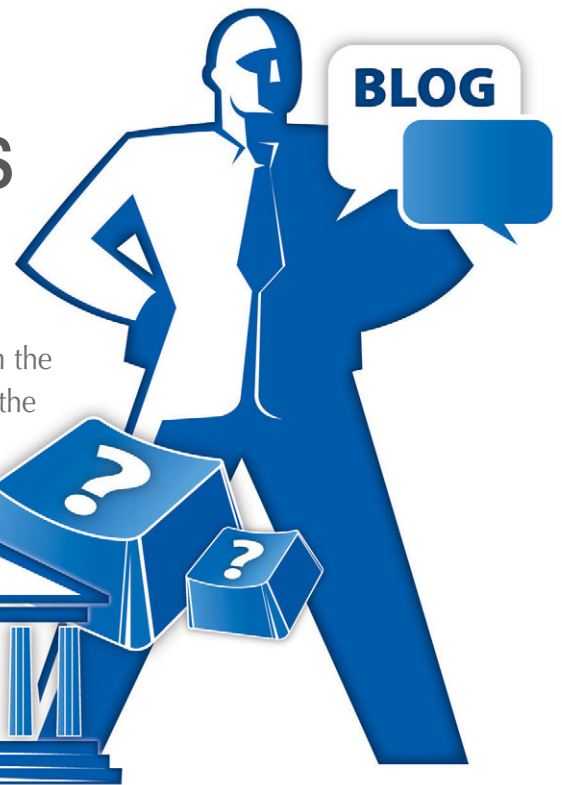
10TH ANNUAL ELITE SDVO SB

NATIONAL CONFERENCE

San Diego, CA | August 21st-23rd, 2013
<http://www.sdvobconference.com/>

Small Business Resources

The Web has a trove of resources for SOHOs (small and home offices) and small businesses—if you know where to look. Find an association that can help you meet your goals; get information from the government about loans, grants, and taxes; and stay up-to-date with the best small business newsletters and blogs. If you have a pressing question, pose it on a forum to see what your peers have to say.



ASSOCIATIONS & SUPPORT

Better Business Bureau
www.bbb.org
(703) 276-0100
4200 Wilson Blvd.
STE 800
Arlington, VA
22203-1838

Main Street Alliance (MSA)
mainstreetalliance.org
info@mainstreetalliance.org
(603) 831-1835
3518 S. Edmunds St.
Seattle, WA 98118

National Federation of Independent Businesses (NFIB)
www.nfib.com
(800) 634-2669
(615) 872-5800
53 Century Blvd.
STE 250
Nashville, TN 37214

National Small Business Association (NSBA)
nsba.biz
(202) 293-8830
1156 15th St., STE 1100
Washington, DC 20005

SCORE

www.score.org
(800) 634-0245
(703) 487-3612
1175 Herndon Pkwy
STE 900
Herndon, VA 20170

Small Business Development Centers Network (SBDNET)
www.sbdnet.org
(800) 689-1912
501 W. Durango Blvd.
San Antonio, TX 78207



BLOGS

Signal vs. Noise
37signals.com/svn/posts

Small Business Search Marketing
www.smallbusinesssem.com

Small Biz Bee
smallbizbee.com

Small Business Trends
smallbiztrends.com

The Small Business Blog
www.sme-blog.com

The Entrepreneurial Mind
www.drjeffcornwall.com



FORUMS

Small Business Administration Community
www.sba.gov/community

The Small Business Community Forums
www.smallbusinessforums.org

Small Business Ideas Forum
www.smallbusinessbrief.com/forum

The Young Entrepreneur
www.youngentrepreneur.com/forum



GOVERNMENT

Grants.gov

House Committee On Small Business
smallbusiness.house.gov

Small Business and Self-Employed Tax Center
www.irs.gov/businesses/small

Small Business Administration (SBA)
sba.gov

U.S. Copyright Office
copyright.gov

U.S. Department of Labor
dol.gov

U.S. Senate Committee on Small Business & Entrepreneurship
sbc.senate.gov

Small Business Development Centers

Assistance For Entrepreneurs

Haven't the foggiest idea how to harness your entrepreneurial spirit, pull yourself anywhere using bootstraps, or think in or out of a box? Starting and running your own business is tough, but fortunately for prospective and current small business owners, SBDCs (Small Business Development Centers; asbdc-us.org) dispense with the clichés and offer training, counseling, and other assistance to help you craft your vision into a real-world success.

Run A Small Business

Pooling resources from federal, state, and local governments, as well as the private sector and the educational community, The Association of Small Business Development Centers is truly a joint venture with a vested interest in fostering small business growth. For an overview of what the SBDC can offer you and your small business, visit bit.ly/dKYe2a. The SBA (Small Business Administration; www.sba.gov) is partnered with SBDCs.

Help On Your Turf

You may be surprised to learn that there's probably an SBDC branch nearby; there are locations in all 50 states, in the District of Columbia, Puerto Rico, and even in the U.S. territories. There are 63 nationwide Lead Small Business Development Centers coordinating program services for every sub-center and satellite location in each state. Centers are made up of directors, full-time staff members, and various part-time staff and volunteers.

The best way to contact your nearest SBDC is to visit the Association of

Small Business Development Centers' Web site (asbdc-us.org), input your ZIP code into the Find Your Nearest Small Business Development Center text box, and then click Go. The results page will highlight Lead Centers but rank centers in order of those closest to your location. Often, SBDCs partner with universities and colleges, and tend to be found on campuses across the country. On the search results page, you'll also find a link to the local office's Web page,

Frequent Question

If you're like many other people starting a small business, funding is at the top of your mind. A common question that entrepreneurs have for SBDCs is: "Am I eligible for grant money?"

The answer depends on the nature of your business. Grants.gov (www.grants.gov) will give you a clear picture of your options before your visit to a Small Business Development Center.

email address, phone number, a fax number if available, and address.

The Closest Thing To A Free Lunch

The services offered may vary by location, but all SBDCs offer many services free of charge. Some typical services you can expect from your nearest SBDC include help with financial, marketing, production, or-

ganization, engineering, and technical problems and access to feasibility studies that can flesh out a fledgling business plan. Some SBDCs also offer affordable training seminars to help with various aspects of running a business. You can also rest assured that your business with the SBDC will remain confidential.

Women's Business Centers

The SBA offers WBCs (Women's Business Centers), which directly serve female entrepreneurs through nearly 100 educational centers nationwide. This organization strives to assist women in overcoming the hurdles they face in today's business environment by offering business management training and technical assistance to all women, with a special emphasis on economically or socially disadvantaged women. The services and training programs are also commonly offered in multiple languages to enable those who speak English as a second language or are still learning English. To find your nearest WBC, visit bit.ly/hs3st2.

Small Business, Big Payoff

Small business owners know that achieving success is about taking risks, innovating, and making tough decisions day in and day out. Thanks to the services offered at the SBA, SBDCs, and WBCs, you're not on your own. ●



The Ultimate Protection

Kaspersky PURE 3.0 Total Security

Kaspersky's ultimate PC security suite, Kaspersky PURE 3.0, has everything you need to secure your online financial transactions, digital identity, documents, photos, music, passwords, and more. It's security tailored to your lifestyle.

In today's always-online, share-everything environment, it's not enough to simply run an antivirus utility and turn on the Windows Firewall. As the threats to your PC's security become more sophisticated, your security software has to be smart enough to counter those attacks and nimble enough to be able to keep up with your various online activities.

Core Protection

Kaspersky PURE 3.0 offers the ultimate in protection against existing and unknown threats. It's capable of stopping malware infections in realtime. In addition, its Automatic Exploit Protection works to keep software and operating system vulnerabilities from giving cyber-criminals easy entry to your home network. If your computer does become compromised, you can quickly and easily roll it back to an uninfected state. And Kaspersky PURE 3.0 is smart about how it scans and updates, making sure you experience little to no performance impact while using your PC.

Antivirus & Beyond

The suite features advanced security technologies designed to secure your digital identity. The Safe Money feature protects your online shopping and banking transactions, and the Secure Keyboard feature protects your privacy when you're filling out forms online. The software also features a two-way firewall to prevent hacker attacks, anti-spam

to block unsolicited emails, application control to prevent malicious applications from launching, and parental control features that let you limit, block, and monitor children's PC & Web use.

Safeguard Your Digital Assets

Kaspersky PURE 3.0 goes above and beyond typical security suite offerings with a fully integrated

password manager, automatic backups that you can schedule to suit your lifestyle, 2GB of free cloud-based storage, encrypted file transfers, a digital file shredder to ensure things you want deleted stay deleted, and PC cleanup tools to keep your system running fast. Best yet, Kaspersky PURE 3.0 lets you manage the security of all your PC's from a single dashboard on one machine. ●

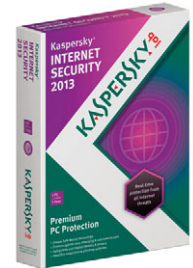


Key Features

Kaspersky 3.0 PURE Total Security



Kaspersky Internet Security 2013



Core Protection		
Real-time Protection secures PCs against known and emerging threats	✓	✓
Hybrid Protection combines the power of the cloud and your PC	✓	✓
Proactive Detection of unknown malware	✓	✓
Automatic Exploit Prevention prevents vulnerabilities from compromising PC security	✓	✓
Advanced Protection		
Anti-Phishing protects your digital identity	✓	✓
Safe Money secures online transactions	✓	✓
Two-Way Firewall blocks hacker attacks	✓	✓
Secure Keyboard protects personal data when using a physical keyboard	✓	✓
Award-Winning Parental Control monitors, limits, or blocks children's online activities	✓	✓
Anti-Spam filters dangerous and unwanted emails	✓	✓
Digital Asset Protection		
Password Manager* secures your online passwords and accounts	✓	
Scheduled, Automatic Backup protects valuable digital assets	✓	
Easy-to-Use Encryption safely stores and transfers sensitive files	✓	
File Shredder irreversibly wipes deleted files off your system	✓	
PC Clean-Up Tools keep your system running smoothly and securely	✓	
Easy Security Management		
Home Network Control manage security for all PCs from one PC	✓	
Free Technical Support via phone, live chat, email, and knowledge base	✓	✓

*Password Manager is not available for x64 operating systems, applications, or browsers.

High quality, ease of use, and wireless versatility

It's a beautiful thing

For exceptional document and photo printing that's intuitive and easy, Canon brings you the PIXMA MX922 and PIXMA MX452 Wireless Office All-In-One printers. These remarkable All-In-One products print, copy, scan, and fax, delivering rich color, crisp resolution, and convenient wireless versatility.

Full Integrated ADF

Both the MX922 and MX452 feature an Auto Document Feeder integrated right into the scanner lid. This makes scanning, copying, and faxing multiple documents quick and easy, without having to sit there and feed each sheet in one at a time. The MX922's ADF holds 35 sheets of plain paper, and is auto duplex capable, so it can scan two-sided documents with ease.

Dual Function Panel

The MX922 features a great space-saving feature called a Dual Function Panel. In Copy and Scan modes, you see illuminated function buttons, but when you put the printer into Fax mode, those buttons transform into an illuminated telephone keypad. Just another small touch that makes Canon Office All-In-One printers so easy to use.

Smart Design

The MX922 and MX452 were not only designed to look nice, but to be practical as well. You'll notice that the control panel interface is placed on the top part of the scanner lid, so when you are scanning oversized objects like books, you still have access to all the controls you need. And the MX452 features a FastFront design that allows you to quickly and easily load paper and ink right from the front of the printer.

Canon's
MX922 & MX452
All-In-One Printers



	MX922	MX452
LCD	3.0" LCD	2-Line LCD
Wireless Printing	✓	✓
Mobile Device Printing	✓	✓
AirPrint	✓	✓
ADF	35-Sheet Duplex	30-Sheet
Ethernet	✓	
Fax	✓	✓
Plain Paper Capacity	250 Sheets	100 Sheets
Print Speed (Black)	15 ipm	9.7 ipm
Print Speed (Color)	10 ipm	5.5 ipm
Photo Print Speed	21 Sec for 4"x6"	46 Sec for 4"x6"

Wireless Versatility

Enjoy the convenience of wireless connectivity. Both the PIXMA MX922 and the PIXMA MX452 are Apple AirPrint-enabled, so you can print from an iOS device, no drivers need. You can also download the Easy-PhotoPrint mobile app for iOS, Android, and Win-

dows RT, so you can print effortlessly from your compatible smartphone or tablet. The PIXMA MX922 also supports Google Cloud Print, PIXMA Cloud Link, and Wireless PictBridge (DPS over IP), so you can print from your compatible Canon wireless camera right to the printer. ●

Quality Products. Quality Output.
From Start to Finish.



PIXMA MX922

Wireless Inkjet Office All-In-One

PIXMA MX452

Wireless Inkjet Office All-In-One






 **PIXMA**
Quality. Promised.

Canon

Selecting Your Next Computer From Tablet To Ultrabook™

Choose The On-The-Go Solution That's Right For You

Confused about what computer is best for you? This chart breaks down the functional differences among tablet, laptop, and Ultrabook™ options. As you can see, an Ultrabook™ provides you with the best of all possible worlds, as you'll enjoy best features of a laptop combined with the sleek design and portability of a tablet. Of course, you might want the PC for only a few specific uses, so check our chart to find out what's best for you.

What Are Your Needs?		Tablet 	Laptop 	Ultrabook™ 
Portability	Less than an inch thick	✓		✓
	All-day battery life	✓		✓
	Convertible styles	Detachable and wireless keyboard		Detachable, flip, slider, and swivel
Office Productivity	Email, video chat, and instant messaging	✓	✓	✓
	Full size screen & keyboard		✓	✓
	Efficiently create, edit, and multitask		✓	✓
Entertainment	Watch, play, and listen to multimedia	✓	✓	✓
	Smooth HD playback		✓	✓
	Wireless multimedia streaming	✓	✓	✓
Powerful Extras	Wakes up in a flash	✓		✓
	Speed boost when you need it		With an Intel Core i5 or i7 processor	✓
	Built-in security to keep files and identity safe			✓

Don't Forget To Check Out The New Intel®-Based All-in-One PCs

Stylish AIO PCs are another great space-saving option for those with office productivity and entertainment needs.

Touch Or Type

Today's Computers Are Capable Of Things Your Old PC Couldn't Dream Of

Powerful Intel®-inspired Ultrabook™ convertibles offer incredibly thin designs—many of which can slide, twist, or flip—and many offer touchscreen capabilities ideal for the intuitive interface of Windows 8.

You'll also be able to choose from Intel®-based tablets that offer a complete Windows 8 experience, with the power to run all the applications, printers, and portable storage you need. Here are just some of the advantages and new features you'll enjoy when upgrading to a new Intel®-based device.

Touch Is Better

- Most new touchscreen PCs feature a 10-point touch display that allows you to pinch-to-zoom, rotate images, and flip through open applications. These new capabilities enhance what you can do with a new computer.
- The touchscreen interface provides a very intuitive experience. Light finger taps will open programs, while a swipe lets you scroll smoothly through Web pages. It's also more engaging, as you'll be able to do things, like splitting screens between apps, without needing to memorize a keypress combination.
- The light weight of Ultrabook™ convertibles and Intel®-based tablets gives you the flexibility to work wherever you go, and touchscreen capabilities further enhance their value. Just watch someone on a crowded plane try to use a traditional laptop, and you'll see why.

New Ways To Edit & Enjoy Video

- Looking for a centerpiece for your media? New all-in-one desktops with touchscreens make for great home PCs, and the big screen is ideal for enjoying home videos



The best Windows 8 devices have Intel Inside™. Ultrabook™ convertibles and Intel®-based tablets can keep up with everything you do.

and streaming online video. Another benefit is that an AIO fits into almost any room (even the living room and kitchen), because modern touchscreen AIOs can be used without mice, while combining your desktop PC and screen into one device.

- Ultrabook™ convertibles feature Intel® Turbo Boost 2.0 and Quick Sync Video technology to make editing a breeze. Turbo Boost 2.0 increases the speed of your processor

to power through video creation, while Quick Sync Video provides serious built-in media chops to reduce rendering time.

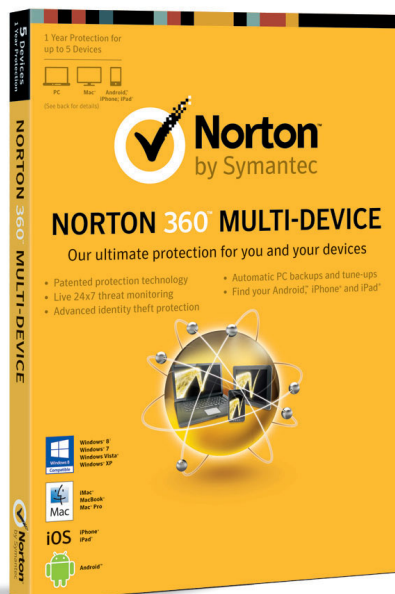
These capabilities are just the tip of the iceberg when it comes to new features available on Intel®-powered mobile devices. You can find the latest Intel®-based devices at Staples; be sure to take advantage of the Staples "trade up to touch" promotion running through April 27th, 2013. ●



Visit www.tradeuptotouch.com to learn more about how you can get up to a \$400 Visa® Prepaid Card when you purchase a new touch-screen PC and trade in your old PC or tablet.

Ultimate Protection for you and your devices

Norton 360™ Multi-Device



\$40 off

instantly at register for
Staples Rewards Members

Provides a single, integrated
solution that protects you
from threats and your mobile
devices from loss

Norton 360™ Multi-Device brings together powerful PC, Mac®, Android™, iPhone®, and iPad® protection to deliver a single, straightforward solution that protects you on the various devices you use. With Norton 360 Multi-Device, there's no need to cobble together separate protection products on your own. It lets you safely surf, shop, share, socialize, and bank online, no matter which device you use.

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- **Network Defense Layer Protection:** Stops online threats before they can reach your computer.
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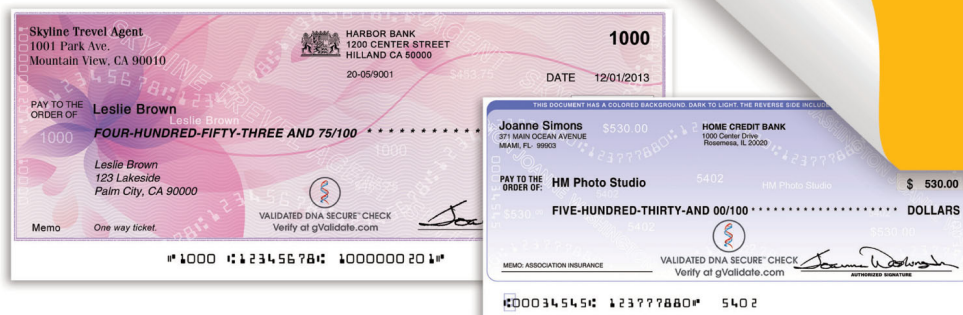
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Modern Monitors

Key Features Of A New Display

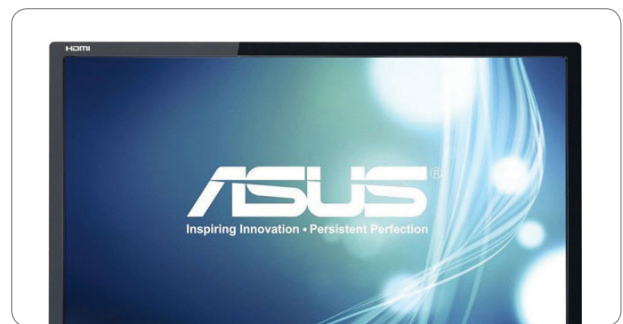
One of the easiest ways to improve your productivity in the office is to invest in a bigger (or in a second) monitor. Take a moment to consider all the time you spend dragging, resizing, minimizing, maximizing, and switching between open applications. Extra screen space will let you more efficiently multitask by allowing you to see and reference the data found on what were previously background applications.

Modern PCs and laptops are also capable of spanning a Windows Desktop across multiple monitors, and some even support three monitors at once. Here's what you should consider when thinking about investing in a new monitor.

Monitor Size

First, take a moment to think about the size of the LCD (liquid-crystal display) monitor in which you would like to invest. You'll generally find the most value in screen sizes from 21 to 23 inches, as these monitors typically support HD-quality video resolutions, provide a wide variety of input options, and are not priced at a premium rate, thanks to their large demand. Monitors with screen sizes of 20 inches and under are typically even more affordable, but the reduced screen real estate may limit your ability to multitask and watch video in HD quality.

Displays sized 24 inches and larger are ideal for those working in graphics design, image-editing, and video-editing roles, thanks to the large canvas and support for 1080p video quality. That said, you'll



24-inch monitors, such as the ASUS VE248HL, provide you with lots of screen real-estate for efficient multitasking.

typically pay a premium for these larger monitors, especially if you're looking at screen sizes above 27 inches. Of course, screen size isn't the only thing that factors into a monitor's price; there are different technologies that affect color and viewing quality. Read on to learn more about these.



The AOC e2351F is a 23-inch LED backlit monitor with a native resolution of 1,920 x 1,080.



An IPS monitor, such as the AOC I2367Fh seen here, offers better color accuracy and wider viewing angles than a traditional LCD monitor.

LCD vs LED

LED (light-emitting diode) monitors (which are in fact actually a type of LCD) provide you with truer color quality and more lifelike video than what you'll find on a traditional LCD monitor, because LED displays offer improved brightness and contrast and more control over the gradation of light intensity. The advantages are due to the light emitting diodes used for backlighting, as compared to the cold cathode fluorescent lamps that backlight traditional LCD monitors. Other than the backlight, LED-based displays utilize most of the same technology as LCD monitors to display content.

Another benefit of LED monitors is that they use less energy than a LCD monitor, so an LED-based display can also help to reduce your energy bill. There used to be a large price jump for monitors with LED backlights, but now the cost difference is negligible. Thus, selecting an LED monitor is a wise investment.

TN Vs. IPS

The vast majority of LCD monitors use TN (twisted nematic) panels to display images on-screen; this is so

common that a TN panel isn't usually listed among the specs. On the flip side, LCD displays with IPS (in-plane switching) panels will certainly be noted in the specs, as advantages of IPS monitors include wide viewing angles and extremely accurate color. The primary (and perhaps only) advantage of TN-based LCDs over IPS displays is that TN technology costs less to manufacture.

Both types of panels can offer fast response times, in the range of 5ms or less, ensuring that video won't look choppy on-screen. Those working with tasks that require accurate color reproduction, such as designers, should look for a monitor that uses IPS technology. For general office work, traditional displays with the (less expensive) TN technology should work just fine.

Monitor Inputs

Today's monitors are generally compatible with a few different types of video inputs to ensure compatibility with the variety of outputs, such as HDMI (High Definition Multimedia Interface), DVI (Digital Visual Interface), and DisplayPort, found on today's PCs and mobile devices. DisplayPort is the newest video interface on the block, and it allows for even higher video bandwidth than HDMI. DisplayPort should eventually supplant leg-



Modern monitors typically support multiple inputs.



A DVI-to-HDMI adapter allows you to connect a legacy PC to a newer monitor that only supports HDMI inputs.

acy VGA (Video Graphics Array) and DVI video outputs, which are what you'll find on most PCs made in the last few years. If you plan on connecting more than just a PC to your monitor, we recommend investing in a monitor that supports HDMI, as it's one of the most popular hi-res video outputs on today's portable technology.

It's important that the monitor you choose is compatible with the types of video outputs found on the devices you use, but note that adapters (such as DVI-to-HDMI and HDMI-to-DisplayPort) and adapter cables can add some flexibility to your monitor choice. If you're looking to future-proof a monitor, you may want to consider investing in a display featuring an HDMI or DisplayPort input. Those with PCs that only offer DVI outputs could invest in an adapter, so the monitor will work with your current PC, and you'll be set up with a monitor that is more likely to be compatible with the video output found on your next PC.

Touchscreen

The recent evolution of touchscreen technology has combined with Windows 8, which features a touch-centric interface, to push touchscreens to forefront. Of course, you'll pay a little extra for a touchscreen moni-

tor, but if the touchscreen will save you time and effort, it may be the way to go. For example, let's say you want to give customers a way to browse and search through your inventory without needing to ask a clerk, but you don't have a free counter on which to place a mouse and keyboard. A touchscreen would let you mount the monitor to any wall, where the customer can simply walk up and begin his search. Similarly, a touchscreen PC at your point-of-sale terminal may be a quick way to increase the speed and accuracy of transactions.

We suggest that you look for a monitor that's qualifies for Windows 8 certification, as that allows the monitor support gestures, such as swiping your finger inward from the right edge to bring up the Charm bar. Touchscreen monitors are currently a bit more expensive, so you'll need to weigh the benefits against the extra cost you may incur.

Display Discussions

In the following pages, we'll provide you with troubleshooting and maintenance tips for your new monitor, and tell you a bit about how they work. This will help you find the causes of problems and keep the monitor in top working condition. ●

Solve Display Problems

Solutions For Common Monitor Issues

Troubleshooting a blank, flickering, off-color, or otherwise unreadable display can be tedious, as there are generally no error messages that point to the true nature of your problem. Luckily, you can often pinpoint the cause by checking the video connections on your monitor and PC or by some quick adjustments to your monitor settings.

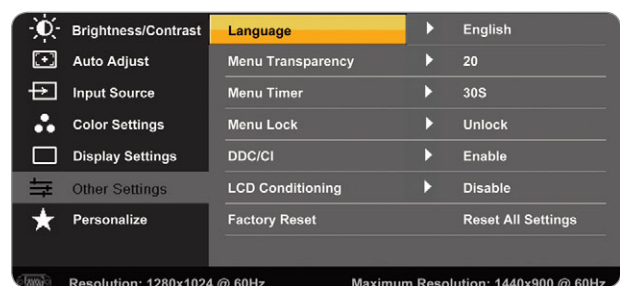
Problem:

The Monitor Displays No Video At All

Solution:

Sounds silly, but first make certain that your computer and monitor are plugged in to a functioning power source, and that they are turned on. If you don't see or hear any indications of power (such as a bright LED or noise from the computer's fans), check that the power cords from the PC and monitor are firmly connected. If your monitor has multiple display modes, toggle between the options via the OSD (on-screen display) controls on the bezel to see if the monitor is simply in an incompatible display mode.

Still don't see anything? Check to ensure that the video cable is connected to video output on your PC and the input on your monitor. Gently wiggle the cord to see if the plugs are secure. If you still have trouble, try a spare (or borrowed) monitor on the computer. Connect the spare monitor to see if the computer is capable of displaying video. If the second monitor works, your original monitor may be faulty. On the flip side, if it doesn't work, the PC may be the cause of your problem.



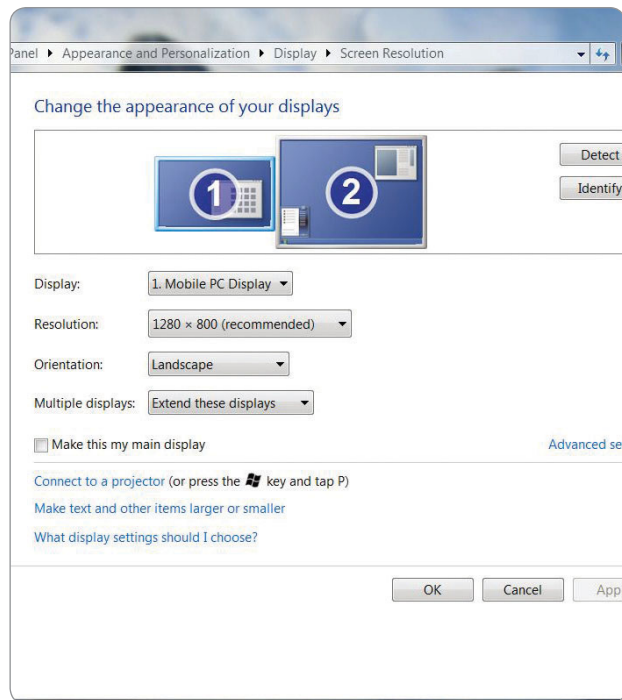
From the OSD (on-screen display), you can make many changes to the visual properties of your monitor.

Problem:

Video Is Too Light Or Too Dark

Solution:

Some monitors feature Brightness or Contrast buttons that could be easily (mis)adjusted while moving or cleaning the monitor. Fortunately, most monitors feature a Default



From Display Settings in Windows 7, you can choose the screen resolution that best matches your monitor.



Avoid using custom resolutions with your monitor, as it may cause problems.

Settings or Factory Reset function you can use to restore the display settings, but many monitors feature an OSD (onscreen display) that will let you adjust the visual properties through a menu system with sliders for each adjustable option. If you've cranked the Brightness and Contrast controls and the screen still seems dark, you may need to take the monitor in for repairs. LCD backlights can sometimes fade or malfunction, which would result in the dim display. (Get an estimate; it may be smarter to simply replace the display, depending on the cost of the repair.)

Problem:

The Image On The Screen Does Not Match The Screen Size

Solution:

It's sometimes possible to choose a resolution that's not compatible with your monitor. For instance, if you select the 1600 x 1200 resolution and the monitor can only handle a resolution of 1280 x 1024, the display may only show part of your Desktop—requiring you to move your mouse to view other portions. Check your monitor's documentation to see the maximum resolution you can use.

To change the resolution in Windows 7 and Windows 8, right-click an open area of your Desktop and select

Screen Resolution. From the drop-down list, select a resolution that matches the native resolution of your monitor. Click Accept; you'll have 15 seconds to approve the change by clicking the Keep Changes button.

Problem:

The Display On The Monitor Seems To Flicker Or Video Occasionally Drops Out

Solution:

Generally, flicker and dropouts are the result of a bad (or poorly connected) video cable running between your PC and monitor. Try unplugging and firmly reattaching the cable to the video input and outputs. Flicker can also result from a change to the monitor's refresh rate, which is the number of times per second the monitor redraws the screen. (The accidental change most often occurs when you update video drivers.) To reduce flicker on your monitor, try to increase the Refresh Rate in Windows. In Win7 and Win8, right-click an open area of your Desktop, select Screen Resolution, and click Advanced Settings. Next, select the Monitor tab and select a different rate from the Screen Refresh Rate drop-down window. Click Apply and try out the new refresh rate. ●

Demystifying The LCD

How LCD Monitors Work

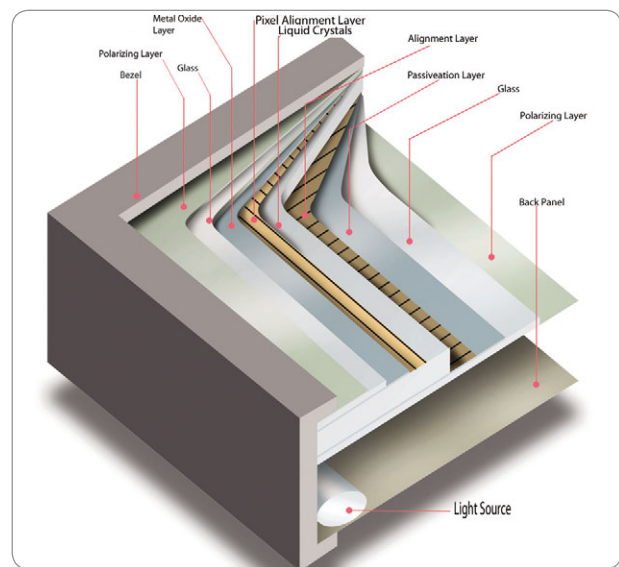
These days, LCD (liquid crystal display) monitors are the de facto standard for displaying images from our desktop PCs. And although there are different types of technology built into the flat screens, such as LED backlights and IPS panels, the basic process of producing onscreen video is the virtually same. Here's a somewhat simplified look at how monitors work.

Liquid Crystals

It's likely that you look at an LCD every day, as LCD technology is found on more than just monitors. It's built into the displays on laptops, digital watches, smartphones, and even the clocks in most of your appliances. The key to the technology is liquid crystal, which is a clear substance that's sensitive to changes in electric current. Even better, liquid crystals don't simply react when electricity is applied to them, they react in a *predictable* pattern. Monitor manufacturers arrange the liquid crystals onto a sheet that allows positive or negative voltages to be applied, which controls the amount of light passing through.

Glass

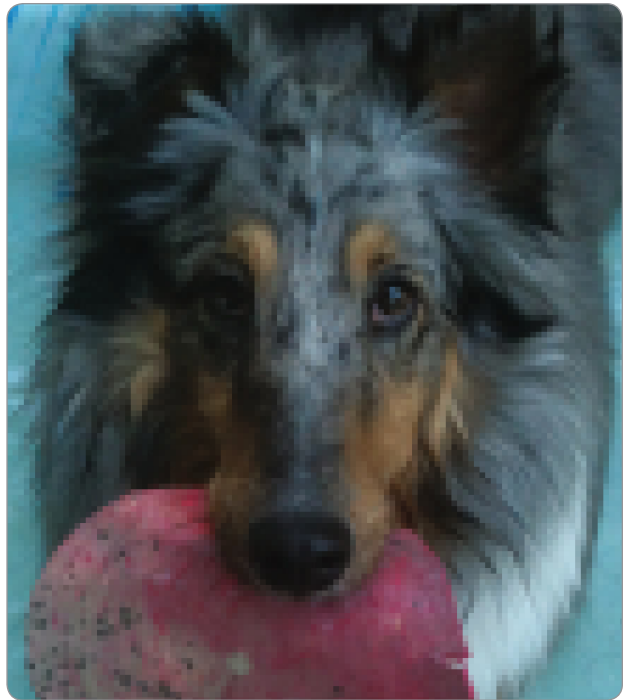
The layer of liquid crystals is placed between two plates of polarized glass. The glass plates feature filters with parallel lines; one filter is set up in columns, while the other is set in rows, creating a grid system. At the intersection points, you'll find a pixel (short for "picture element") on top of the filter.



Here you can see the different components of an LCD.



LED backlights can help to improve the color quality of a monitor.



Pixels represent the individual picture elements of a photo. Here's an example of a photo with too few pixels. The result is that you can actually see each element.

Backlight

Liquid crystals themselves aren't capable of emitting light. For that, you need a backlight, a light source behind the liquid crystals and glass plates. In modern monitors, the backlight could be made of LEDs (light emitting diodes) or cold cathode florescent tubes.

Pixels

When electricity is applied to the liquid crystals, a given amount of light is allowed through the liquid crystal molecules. Each pixel is built with three sub-pixels: one green, one red, and one blue. These sub-pixels can be partially turned on or off to create the correct shade of color for each pixel. The combination allows for up to 256 shades of color. Each individual pixel is quite small. For example, monitors that support 1080p video quality are built with a grid that's made of 1,920 pixels wide and 1,080 pixels high—that's more than 2 million individual pixels.

Refresh

The color of each pixel is changed many times each second. Typically, monitors feature a refresh rate of 60Hz,

meaning that the monitor will redraw the entire screen 60 times every second. Some monitors are capable of refresh rates of 120Hz or 240Hz. Our brains process this as flicker-free video, so you'll never notice individual pixel changes unless your monitor has a dead pixel (one that's permanently dark) or a stuck pixel (one that's permanently a single color). ●

A Brief History Of LCDs

Liquid crystals were discovered in 1888 by an Austrian botanist named Friedrich Reinitzer, although the phenomenon was not fully explored until 1963, when an RCA chemist named Richard Williams found that light would change when passed through an electrically-charged liquid crystal. This led to the discovery of the LCD. In the 1970's, Sharp designed the first mainstream LCD-based product, an electronic calculator. In the late 1990's, monitor manufacturers began releasing LCD monitors for use with desktop computers.

Monitor Maintenance

Care For Your LCD

Monitors are one of the more maintenance-free pieces of computer hardware you'll find, but that doesn't mean the display shouldn't get a little care every now and then. Here, we'll discuss what you can do to clean and maintain your monitor.

A Clean Screen

An LCD screen requires the use of a specific cleaning solution to provide you with a streak-free look. Standard window-cleaning agents often contain ammonia, which can damage the display. You should also avoid cleaners with acetone, ethyl alcohol, ethyl acid, and methyl chloride. Instead, invest in a monitor-cleaning spray and a microfiber cloth (or other soft cloth) to wipe down the screen. The display itself is sensitive to scratches, so avoid using paper towels, regular towels, and napkins. Generally, the proper way to apply a monitor cleaner is to spray it onto the microfiber cloth, and then wipe down the screen. Spraying the solution directly onto the screen can cause streaks or leave a mark.

Clean Heat Vents

You're likely familiar with the dust buildup that occurs around the fans in your PC. Monitors don't have internal fans to keep them cool, but they do have heat vents. And just as with your PC, you don't



Monitor cleaning solutions often come with a microfiber cloth.



You can use a can of compressed air to clean dust out of the vents.

want dust to accumulate in front of the vents, because it can prevent the heat from escaping, which will reduce the lifespan of your monitor. To clean dust from the vents, invest some canned air that you can use to blow the debris out of the unit. If dust has accumulated around the bezel, you can use the canned air to blow dust off the monitor, or use a dry cloth to brush the dust off. ●

Business Tech

Add eCommerce To Your Website



you often have little control over how they're presented, arranged, and sometimes even priced. For instance, if you have a new product you'd like to start selling to rival a competitor's product, the middleman you're selling through may not be able—or even willing—to replace your old product with the new one in a timely manner, giving your competitor an unfair advantage in your market.

While it's true that most ecommerce features you add to your website will cost you a percentage of each sale, these fees can be minimal and in many cases amount to less than you're paying a third-party website to list your products.

If you've yet to stake your claim on the Web, then there are a variety of website-building services that include ecommerce in as an add-on or as part of a small business-centric package. Opting for one of these services can greatly simplify the task.

If you already have a website, then there are a multitude of services that let you simply add a shopping cart and checkout functionality to your existing site without forcing a complete overhaul or adding a lot of extra design work.

Finally, one of the best reasons to add ecommerce is to simplify things for your customers. With a built-in storefront, your website will become the one place they come for product information, technical support, customer service, and purchasing. You become solely responsible for the customer's experience, from the moment they first learn about your

Converting your website from being a simple point of contact with links to places where customers can go to buy your products into a Web-based marketplace where those customers can actually buy your products is no simple task. But if you approach it knowing what to expect each step of the way, and with an understanding of the basic costs involved and the technical requirements, you can avoid many of

the pitfalls that make small business owners flinch at the very mention of ecommerce.

Why Bother?

There are several compelling reasons to add an ecommerce component to your company's Web presence, the first of which is that it gives you more control over the marketing of your products or services. If your products are sold elsewhere,

Step 1: Choose a button type and enter your payment details

Choose a button type

Shopping cart

Note: [Log in](#) to My Saved Buttons to create a new button similar to an existing button.

Item name

Crazy Eddie's Shirt 'O The Week

Item ID (optional)

21203

[Which button should I choose?](#)

Customize button

☒ Add drop-down menu with price/option [Example](#)

Colors: Black, Red, Green

[Edit](#) | [Delete](#)

☒ Add drop-down menu [Example](#)

Sizes: 3X Large, 2X Large, X Large, Medium, Small, X Small

Your customer's view

Colors

Black \$9.99 USD

Sizes

3X Large

You don't need to know how to code to be able to add rich and functional payment features to your website.

product until they come back to buy another. And another.

Shopping Cart Options

There are two ways to get a shopping cart on your site: using a comprehensive website-building suite that offers an ecommerce component, or by using one of a variety of services that let you add a shopping cart to your existing website.

In the case of the software suite, you'll often be paying some money up front for the software tools, and may need to access customer support for help walking you through the process should you get stuck. This is a big advantage of suites like this, but keep in mind that adding a shopping cart to your site involves maintaining a payment gateway service of one kind or another, whether the software publisher offers that service or you do, by seeking out a third party to meet that need. This payment gateway service will also cost some money, typically a monthly fee and

a per-transaction fee of between 1% and 3% of the final price. Almost all of these services will let you accept credit and debit card payments, but some also add the ability to accept other forms of payment, including checks, money orders, and offline credit card payments.

Site From Scratch

If you're building your website from scratch, then you'll want to choose a site-building suite that supports ecommerce features out-of-the-box. These can come as boxed software or online services. Most such site-building tools will present you with a range of templates that you can use as the basic framework for your ecommerce site. If the software comes with case studies or example sites, look at them to determine the most suitable template to get started with. It's also a good idea to look at some of your competitors' websites to get a sense for what works well and what you could

improve upon. Before you choose a template, make sure you are aware of any and all copyrights and exclusivity agreements; some templates and design elements might have use limitations that could interfere with your site plans. Thankfully, most all-in-one website building suites have royalty-free templates and designs that give you the freedom to use, reuse, and copy them at will.

Believe it or not, you can build your own website without learning to code in HTML. Sure, knowing a little can help, but most newer Web design suites utilize graphical interfaces, check boxes, and step-by-step tutorials that let you design your website just as your customers will see it. When you're finished, the software will generate all the requisite code for you, ready to upload to the Web.

The Simple Approach

There are numerous options available for those looking for a fast and easy way to add an ecommerce

☒ **Track inventory**
Don't oversell items not in stock -- Get an email alert when inventory is low.

☒ **Track profit and losses**
View profit and loss report by product/service.

☒ **By item - Crazy Eddie's Shirt 'O The Week**

Item ID	Qty. in stock	Alert
21203	75	10

☐ **By option (in drop-down menu)**

Can customers buy an item when it is sold out?

☐ Yes, customers can buy the item as usual.

☒ **No, don't let customers buy the item.** [Preview](#)

Take customers to specific page when they click **Continue Shopping**

Ex: <http://www.mybuynowstore.com>

Inventory tracking features are a great way to ensure that your products don't sell out.

You are viewing your button code

1. Click **Select Code** to select all the button code.
2. Copy the code (CTRL+C for Windows, CMD+C for Mac -- or right-click and choose Copy).
3. Paste the code into your own code (CTRL+V for Windows, CMD+V for Mac -- or right-click and choose Paste).

[Integration tips](#)

Website

```
<table>
<tr><td><input type="hidden" name="on0"
value="Colors">Colors</td></tr><tr><td><select name="os0">
<option value="Black">Black $9.99 USD</option>
<option value="Red">Red $9.99 USD</option>
<option value="Green">Green $9.99 USD</option>
</select> </td></tr>
<tr><td><input type="hidden" name="on1"
```

Buyer's View

Colors
Black \$9.99
Red \$9.99
Green \$9.99

Sizes
3X Large

[Select Code](#) [Go back to edit this button](#)

Create more buttons

[Create similar button](#) | [Create a new button](#)

Similar: Use the button you just created as a template for another button.
New: Create a completely new button from a blank form.

[Create a View Cart button](#)

Give your customers convenient access to their shopping carts with a View Cart button. You need just one View Cart button for a website.

[Go to My saved buttons](#)

- Edit most characteristics of a button.
- Create a new button that is similar to an existing one.

My saved buttons

With a button-building wizard like this, you can copy and paste the shopping cart's HTML code right in with your website's code.

component to an existing website. In most cases, adding a shopping cart button, inventory management, and payment processing features can be less expensive than starting from scratch. In fact, some services offer these services for free, in conjunction with a monthly account.

When selecting your service, make sure it supports a shopping cart summary. This is an icon that most often appears in the top right corner of the screen and indicates the number of items currently in the shopping cart and the current subtotal. Some of the better options available let your customers quickly change the quantity, size, and color of the items in the shopping cart by clicking the icon.

One such service let us add multiple dropdown menus; we used one to let customers change the size and another to let them change the color of the item in the shopping cart. We were also able to add inventory management alerts by indicating the

total number of products in stock and supplying an alert quantity, or number that indicates that stock is running low.

Once you've created your button using the service, you'll get a block of HTML code that you can copy and paste into your website-building software's code window (not in a field designed to accept plain text).

Some services offer more advanced features than others. If you ever plan to offer coupon codes, for instance, it's helpful to find a service that supports that capability. You can always add fields and icons to your website after the fact, but it can be complicated and involve copying code from one or more sources to get it working properly.

Extras

In some cases, you may need software or services that fall outside of the scope of the website-building suite, payment gateway service, or shopping cart website

plug-in. Examples include image-editing software that lets you create transparent logos and icons. This lets you create professional-looking buttons and icons that match your site's style.

If you're just dipping your toes into the ecommerce waters, then you probably need to consider what happens after customers make a purchase: shipping. You can package products yourself (this will almost always save you money) and drop them off at a shipper, or use one of several from-home services that let you purchase and print valid postage, print labels, and track your shipments from home.

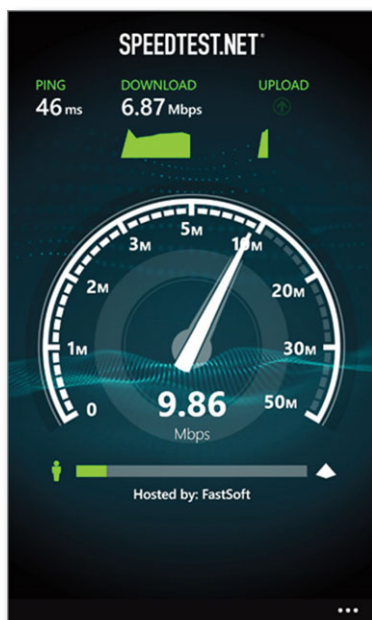
Check Out

With an ecommerce component built into your website, your customers are now wholly your responsibility, so customer satisfaction is totally up to you. The minutia of running your own business can be daunting, but the sky's the limit when it comes to the potential payoffs. ●

Mobile Marketplace

Business Apps *For Android & Windows Phone & iOS*

Some powerful business tools are floating in the sea of smartphone apps. Each month, we'll highlight some of the best ones for Windows Phone, iOS, and Android platform users. (Unless otherwise noted, Windows Phone apps are available in the Windows Phone Apps & Games Store, Android apps in Google Play, and iOS apps in Apple's App Store.)



Speedtest.net

Windows Phone

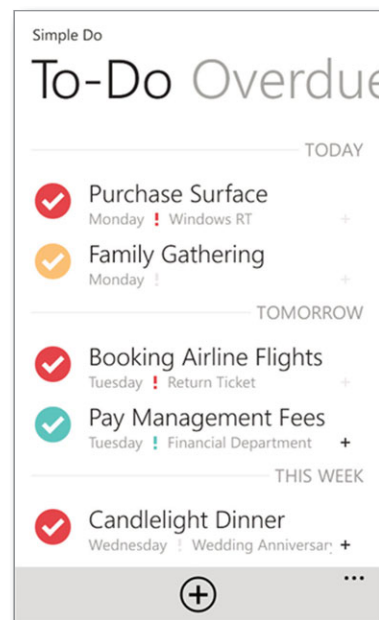
We've been using Speedtest.net to determine the bandwidth on our test systems for quite a while, but it turns out you can do the same with your Windows-based smartphone. This app shows you your download and upload speeds in Megabits per second and your Ping. You can also view a real-time speedometer and graphs that show you the peaks and valleys that make all the difference. Just like the website, you can choose your preferred server from a massive list of servers from all over the world. The app also displays speeds in your preferred unit and lists your internal and external IP.



Power Project

Windows Phone

A good task manager, like Power Project, is worth every penny. This one stands above the rest for its prioritization capability, which lets you rank some tasks above others. Because the app supports live tiles, you can get a sense for how close you are to completing a task without even launching the app; the red task icon turns green from the bottom up over the course of the app's duration. Other features we like include the ability to pin individual tasks to the Start screen, view the next task in the queue from the live tile, and view a completion percentage for each task.



Simple Do

Windows Phone

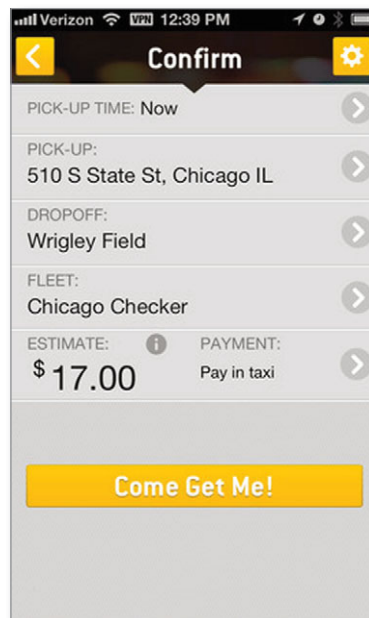
Simple Do is a very polished To Do list app that runs well on Windows Phone 8 and 7.8-based devices. One of the coolest features, exclusive to Windows Phone 8, are the lock screen notifications. These let you glance at pending items without even unlocking your phone. This app also supports due dates, reminders, priority, and lets you add notes. The procrastinator in us also likes the ability to postpone an item by a day with a simple tap. Helpfully, when a task expires, it moves into the Overdue column, so you'll never lose track of your tasks.



Local Gas Prices

iOS

If the gas price roller coaster has you feeling nauseated, check out the Local Gas Prices app. This utility uses your current location to display the current price per gallon of regular, plus, premium, and diesel at nearby gas stations. Before you make a trip to a given station, you can glance at the top of the main screen to see how recently the gas prices were updated. You can search by ZIP Code, sort by your preferred gas type, and display all stations within a given radius. If you only ever buy regular, for instance, you can easily disable price listings for the other gas types from the settings menu.

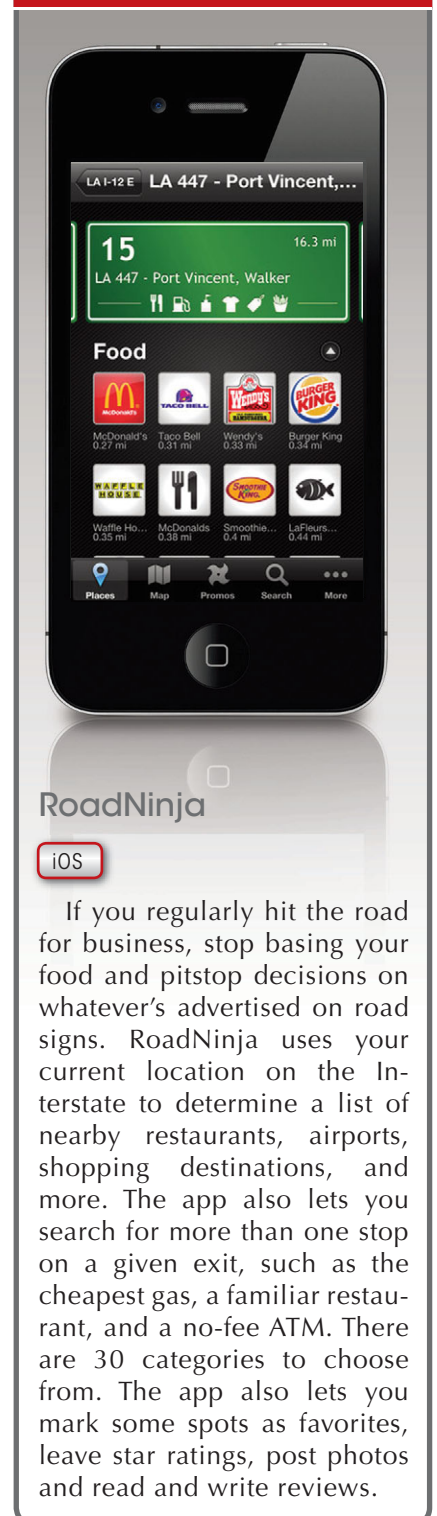


Taxi Magic

iOS

If you ever feel like there's never a taxi when you really need one, try out Taxi Magic. This app lets you find nearby taxis, book one directly from your iOS-based phone or iPad, track the taxi's progress to your location, and more. The app taps into the networks of 75 leading taxi fleets in 50 of the largest cities in the U.S. You can also use the tap-to-call feature to contact more than 4,000 cab services in the U.S., Canada, and Mexico. The app also lets you use your credit card to pay for the ride and quickly generate an expense report receipt for the fare.

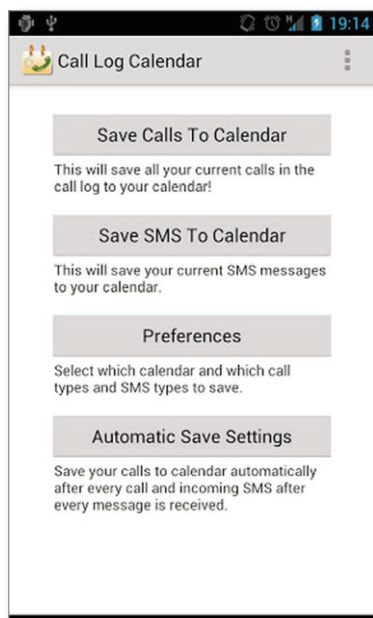
App Of The Month



RoadNinja

iOS

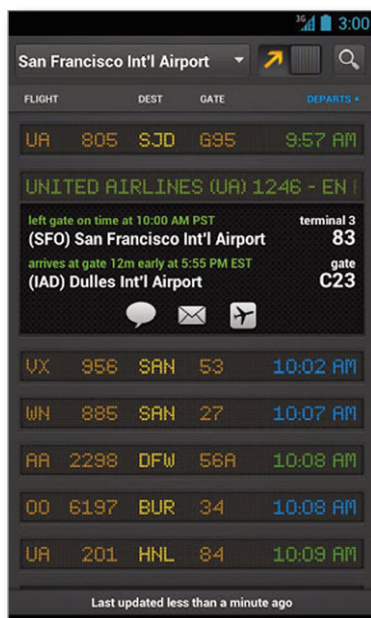
If you regularly hit the road for business, stop basing your food and pitstop decisions on whatever's advertised on road signs. RoadNinja uses your current location on the Interstate to determine a list of nearby restaurants, airports, shopping destinations, and more. The app also lets you search for more than one stop on a given exit, such as the cheapest gas, a familiar restaurant, and a no-fee ATM. There are 30 categories to choose from. The app also lets you mark some spots as favorites, leave star ratings, post photos and read and write reviews.



Call Log Calendar

Android

Unlike with email, communications that occur on the phone can slip away if you don't manually make note of them. Call Log Calendar fixes that by adding these items to your device's calendar, so you can more easily place where you were and what you were doing when you got the call. This app also lets you add SMS messages to your calendar. The app tags each calendar entry with location data using either GPS data or the network location. We also like how you can set how many of your recent calls to save to the calendar, up to 500.



FlightBoard

Android

Even without delays, flying can be a headache, but throw in a schedule disruption and things can go south fast. With FlightBoard, no matter where you are, this useful app lets you check the status of flights (well, not during takeoff and landing). The app can show flight times and delays for over 4,000 airports and more than 1,400 global airlines. The app refreshes the flights' statuses every five minutes, making it incredibly accurate. Uniquely, you can set FlightBoard as a live wallpaper, so you'll know what you need to know without even launching the app.



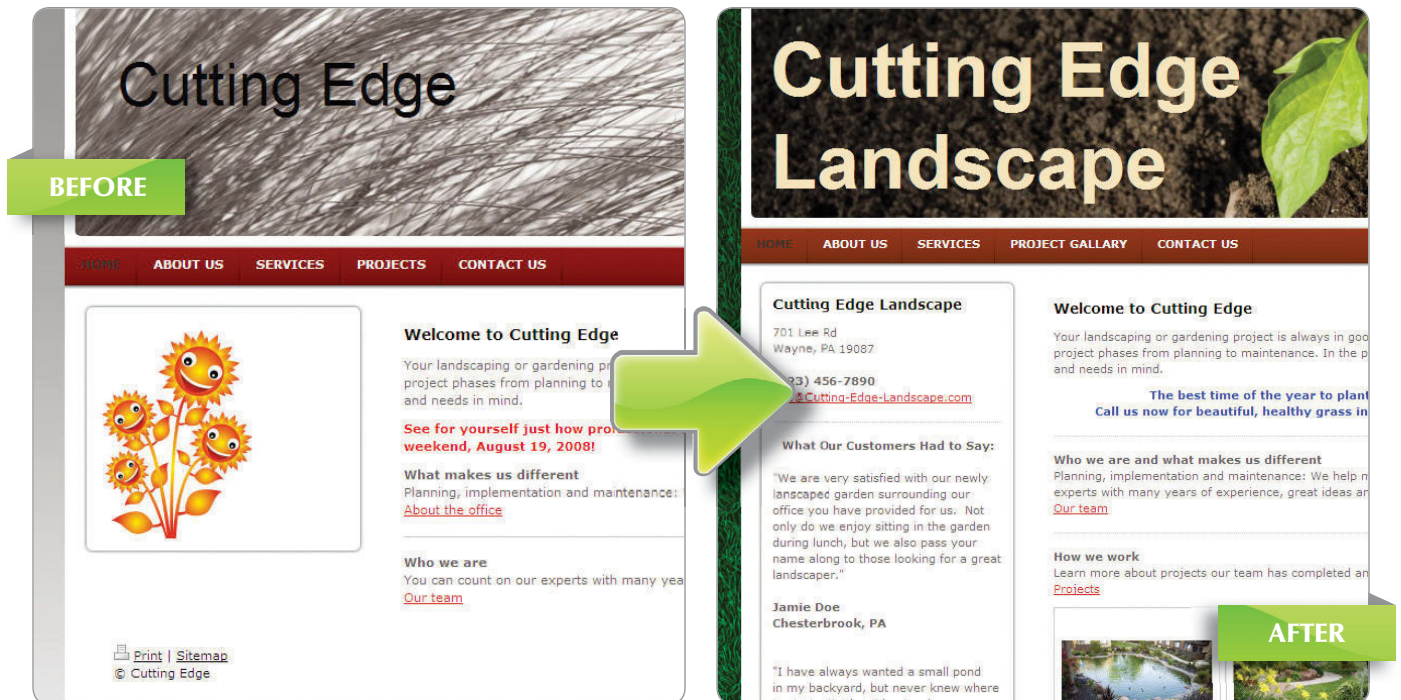
Payroll Guru

Android

If you handle payroll for your organization, then you know that there are certain times of the month you just can't leave the office. But with Payroll Guru, you can calculate net paychecks from gross wages for any employee, salaried or hourly paid, wherever you are. This app supports pre-tax and after-tax deductions, such as 401K, health, dental, Roth IRA, and more. You can also create profiles, which can make calculating pay for similar types of employees quick and easy. The app also supports settings indicating the state of employments, payroll frequency, marital filing status, and more.

Website Makeover

Bring In Business With A Better Design



This example website has plenty of room for improvement. The grass image is interesting, but it doesn't give the visitor a sense of the services that Cutting Edge provides. More importantly, it makes the company name difficult to read. The text on the main page lacks organization and doesn't guide the reader. After a makeover, these problems have been corrected. The image is more compelling, the company name is easy to read, and now it includes "Landscape," so visitors know right away what the service provides. Testimonials, contact information, and images of previous work are easy to spot.

You know how important your company website is. You have one, and you update it regularly to keep things fresh for potential clients. And yet, you're not quite satisfied with it, are you? Your website is respectable and looks professional, but in the back of your mind, you wonder if it could be doing a better job of selling your business. Chances are, your website has some room for improvement.

Happily, bringing your website up to speed isn't difficult. We'll discuss some ways that an average website can be transformed into a dynamic

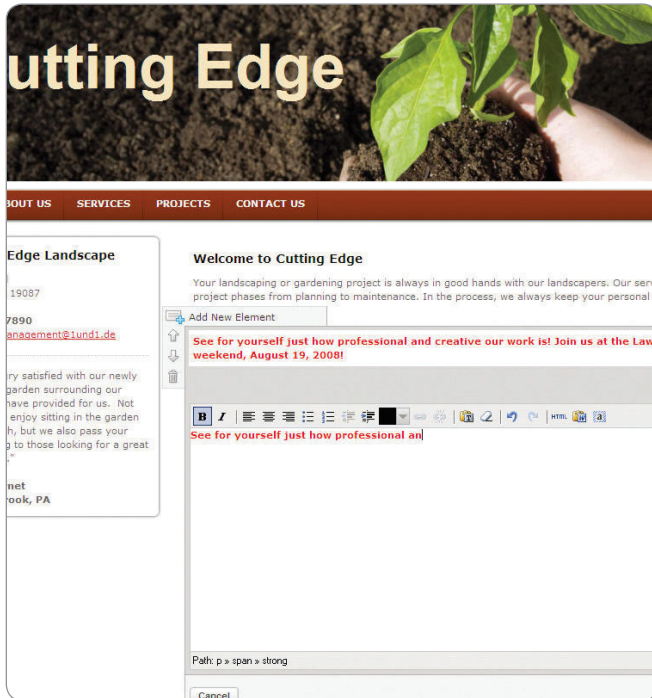
and effective sales tool. Follow these easy website design tips and your site will have the polish (and information) necessary to turn visitors into clients.

Website Layout & Design

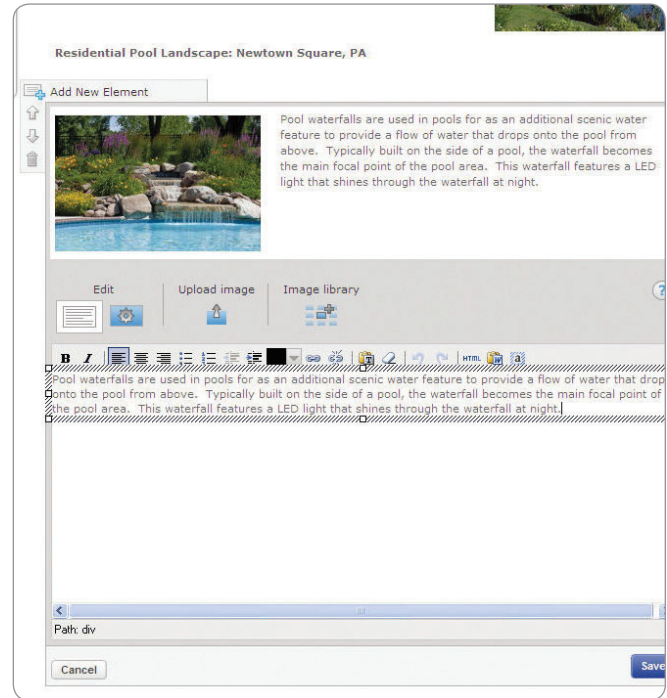
Flow is critical to your website's effectiveness. Does your website guide visitors right to the pages you want them to see, in the order that you want them to be viewed? If you aren't creating a path for your site visitors to follow, they may never see information that could lead to a contract or sale.

Your site should guide your visitors through an explanation of who you are and what services your business provides (in general terms) before getting into details about specific services. Finally, it should direct them to your contact information. For most sites, the menu bar is that guide. Organize its tabs, assuming that the reader will click them in order (left-to-right for horizontal menu bars; top-down for vertical bars).

Consistency is important to the flow of your website. Create a color scheme (you may want to base



Consider changing the colors, fonts, and text sizes, among other characteristics. Feel free to use bold colors, but don't overdo it, and keep your design consistent throughout the site.



Use images to emphasize points in your text. When uploading a photo to your site, you may be able to move, crop, and edit the image using the provider's utility.

it on your company logo) and then use those colors throughout the site. Keep the text consistent, too: Try to cover one topic per page, rather than cramming multiple ideas together.

Another important aspect of good website design is readability. Loud backgrounds can make your text hard to read. The same goes for light text colors or complicated fonts. You're not likely to make this mistake with the site's main text, but it's easy to forget these rules when adding text to menu bars and other parts of the website. Generally speaking, avoid using all capital characters, as your visitors may interpret text in all caps as yelling.

Giving your main page a frank assessment will likely turn up plenty of problems, but that's a good thing. Improving your website boils down to troubleshooting: Solve the problems, and you'll have a better site.

Photo Integration

In many ways, your website amounts to an elevator pitch. Your site has just a few short minutes (or less) to convince visitors that you are a pro and that you offer the services they need. Photos can play a big role in quickly forming a visitor's opinion, so give them as much thought as you do to the text. Use photos to illustrate your main points.

While certain visuals greatly affect your website's effectiveness, skip images that will distract the reader from your work. In fact, when possible, use images of your work to show visitors what you are capable of and build their confidence: Let them know that your business is the right one to take on their projects.

Testimonial Features

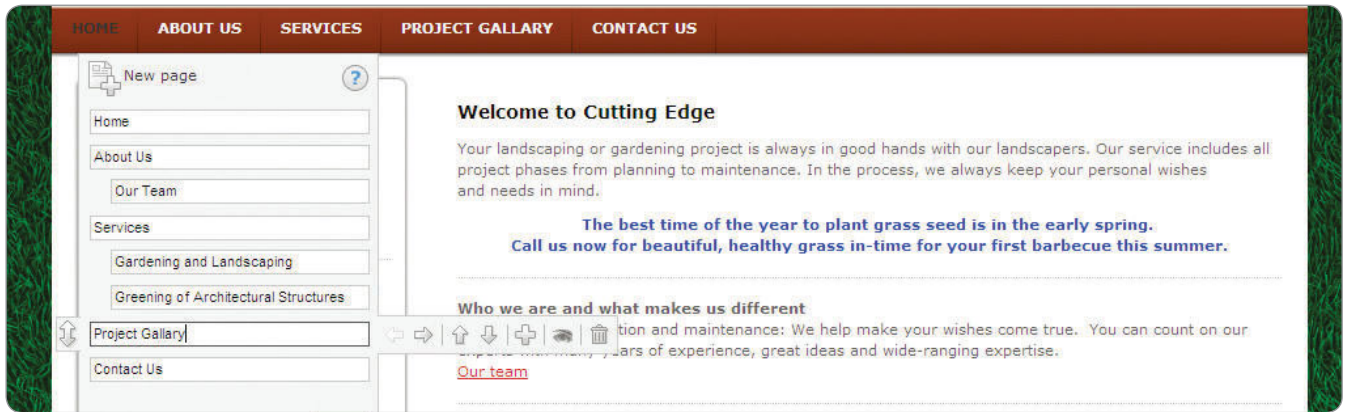
Showcase your testimonials. Use quotation marks and, if he

approves, your client's name and general location. Many websites set the quotes in italics. It's generally acceptable to shorten a lengthy quote with ellipses (...), but run any such changes past your customer before putting the quote online, or you run the risk of alienating a customer who disapproves of your edits.

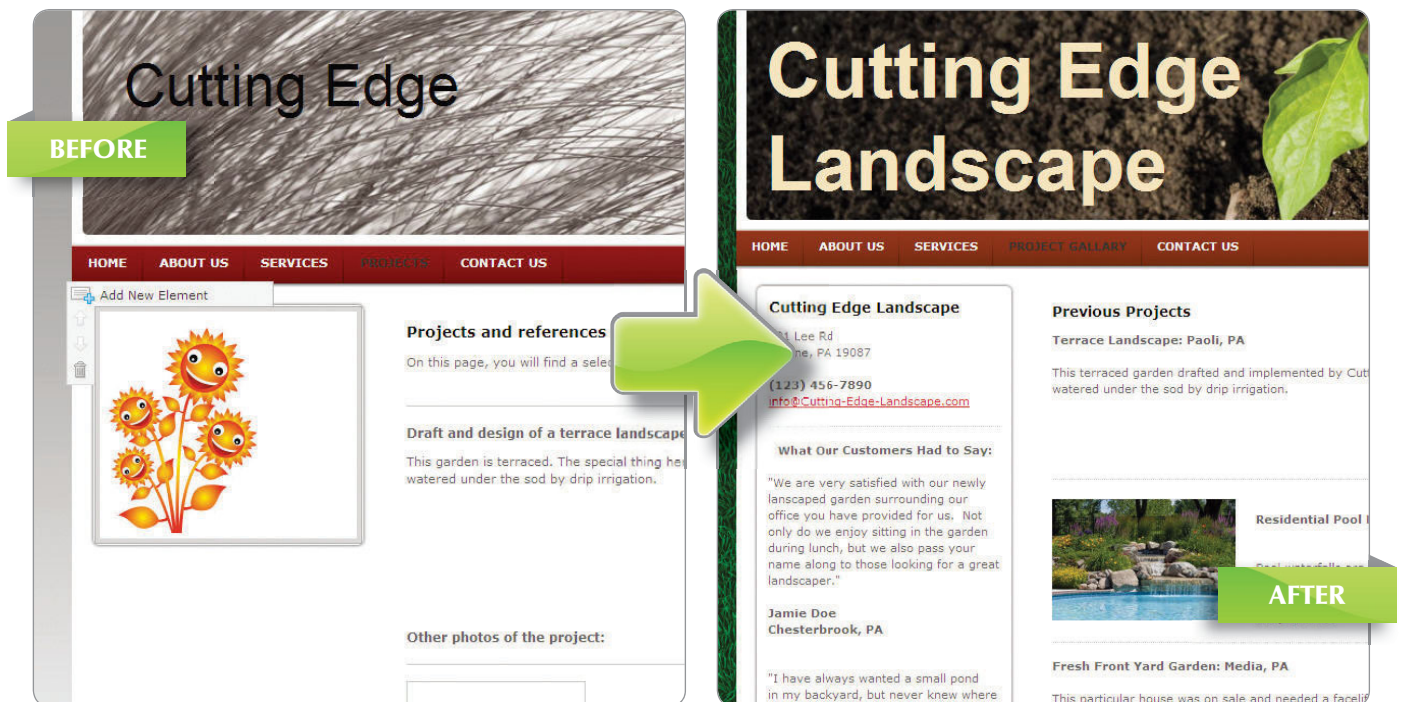
Photos of past work make excellent testimonials—and they can give visitors new ideas for their own projects. When you provide a photo of work you did for previous clients, make sure the reader understands the context of the picture. A caption, for example, gives you a chance to explain the goal and outcome of the project.

Contact Information Visibility

Putting your contact information on the main page will give your company an instant credibility boost



The menu bar walks your site visitor through your sales pitch and to your contact information.



The Projects gallery in this example site would benefit from context: Where did this happen? Who was the client? A site visitor isn't likely to relate to these photos. The new page, with clear descriptions that promote the company's capabilities, will do a better job of inspiring visitors.

in the eyes of many visitors. At the very least, include a Contact Us page that provides multiple ways to reach you.

Keep in mind that many customers use social networks. Create profiles for your company on popular networks and encourage your site visitors to Like (Facebook) or Follow (Twitter) you. And don't

forget to link from your social network profiles back to your website.

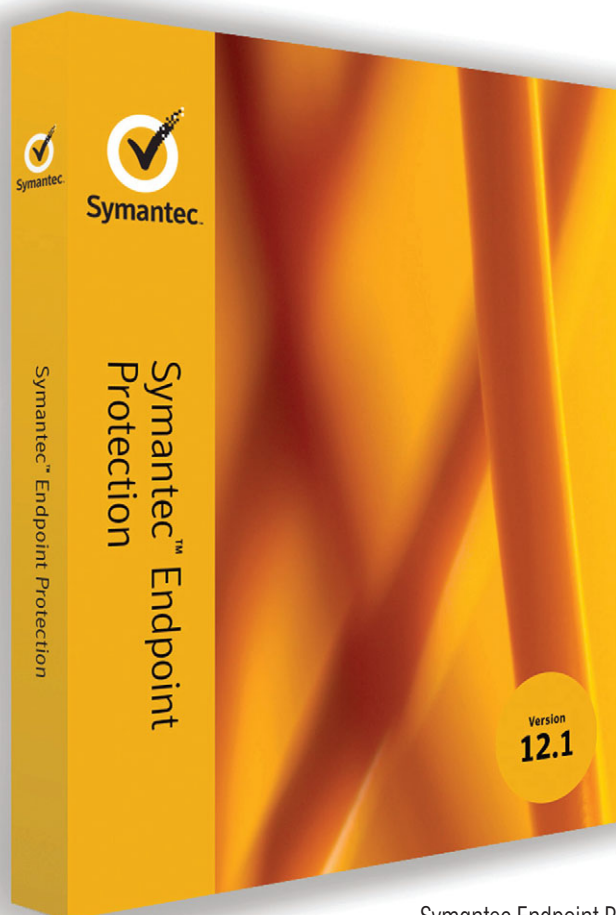
Give Your New Look Another Look

We'd be surprised if all this shuffling and updating didn't lead to the occasional typo, broken link, or wrong graphic. Before you unveil the site to the public (or as soon as

possible afterward, if you're a little ahead of us), browse your website; particularly your main page. You'll have a better chance of catching mistakes if you read it out loud (take it from us), but even a quick read-through ought to turn up any glaring errors. With that last bit of polish, your site is ready for prime time—and you can get back to business. ●

Business Tech

When Disaster Strikes



Symantec Endpoint Protection is a good option for adding virus and malware protection to multiple desktops, laptops, and file servers.

services. Man-made disasters can be just as devastating. These include data breaches, cyber attacks, negligence, maintenance failures, vandalism, and poor planning.

Disaster preparedness is a core concern for the IT department. Whether disaster recovery falls under your job description or not, it's up to you to create policies, adopt technologies, and take steps that will ensure your business keeps running in the face of any of the above. Although no two businesses are built the same, there are a handful of steps every business should take to ensure it's ready for practically any unexpected interruption in normal operations.

Ready For The Worst

The first thing you should do is identify your most critical resources and rank them based on compliance requirements and the data's importance to your core operations. For instance, if your business handles customer financial data, then laws (and common sense) dictate that these be secured first and protected against outside breaches and access by unauthorized personnel.

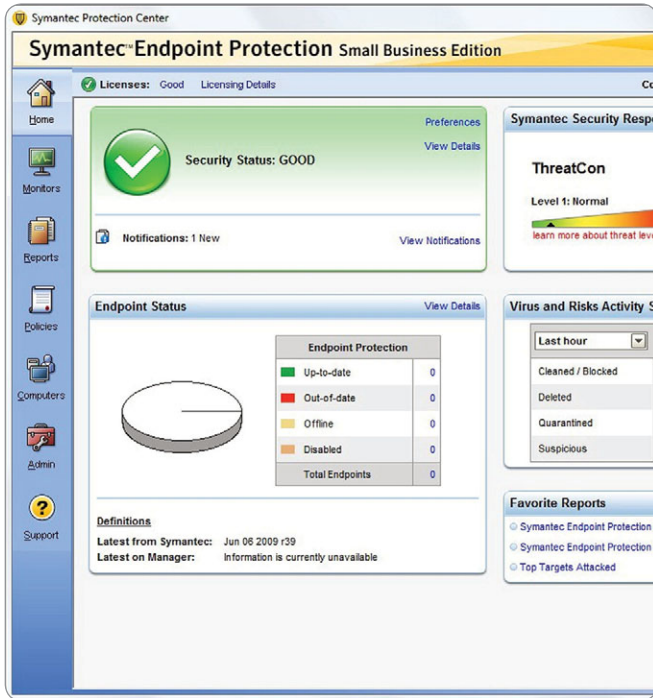
The best way to do this is to build and maintain a secure network. Wired networks are easier to secure against outside breaches because any physical access needs to come from within your building. Wireless networks should not only be encrypted, but also sandboxed from the rest of the local network. It's also a good idea to make sure that access to your most critical data is blocked from remote access except via secure login.

You never really know exactly how prepared you are for a disaster until you're staring one down. Which is why it pays to be ready for any eventuality that could result in service outages, downtime, and—perhaps most especially—data loss. In this article, we'll discuss several tips that may help your company minimize risk and mitigate potential

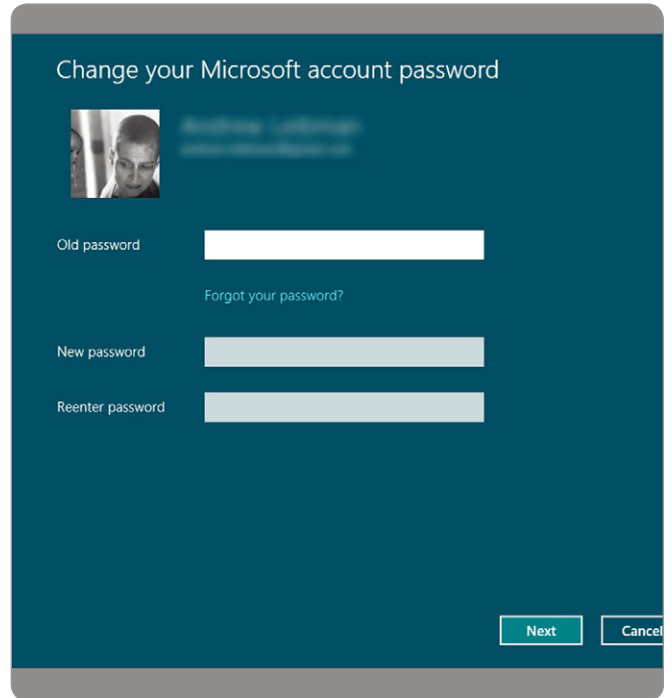
damage, should you encounter a disaster scenario.

What Is A Disaster?

In short, any unplanned event that results in a permanent or temporary service outage, facility closure, data loss, or interruption in business operations. Natural causes include severe weather damage, fire, or an unexpected interruption in utility



The Symantec Protection Center lets you quickly view your system's current threat level at a glance.



Proper training can help your employees create and maintain secure passwords.

Restrict Access

Institute comprehensive access control measures. This starts with restricting critical information access to just a handful of your most trusted employees. Make sure everyone who has administrator-level rights is required to use a secure login. Limiting access to all critical data may be impractical, but cardholder data, for instance, may be something on which you can put heavier restrictions. One effective way to do this is to block its remote access by putting it on a secure server or system that must be physically accessed from one or more secure terminals.

Communicate

You and your employees are on the same team, so it's important to communicate the new security protocols as you implement them. Be sure to explain why they are necessary. A vast majority of the security breaches can be prevented through

employee education. Other things to cover with your employees include how to generate safe passwords (using eight random characters or more, incorporating symbols and numbers, and alternating capitalization), strategies for remembering those passwords without using sticky notes, and how to avoid choosing passwords that can be breached by brute-force dictionary searches and social engineering. Using your birthday, the names of your children, or your home phone number are all among the cyber thief's first guesses when it comes to trying to crack passwords. Other topics to cover include social media protocol, Internet safety, effective malware response, how to deal with spam, and what to do about attachments and links in questionable emails.

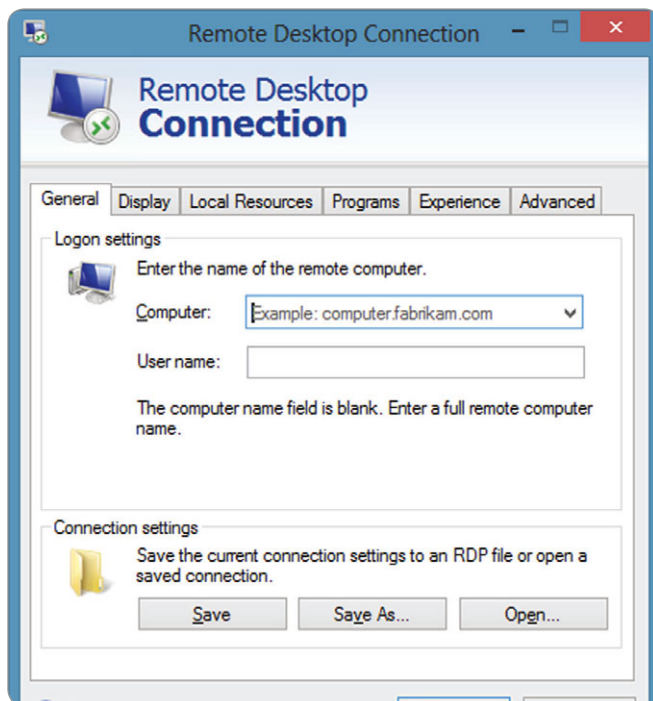
Invest In Utilities

The next step is to maintain anti-virus and anti-malware utilities, not

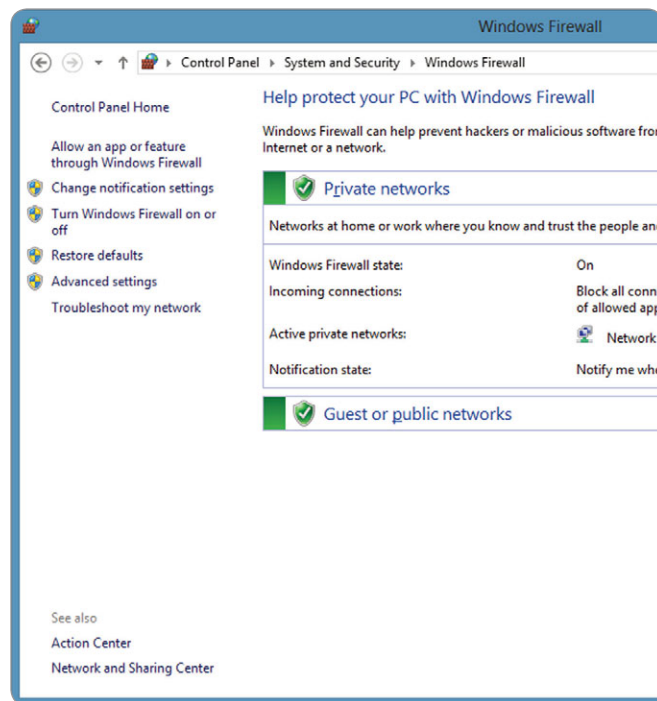
just on any system that handles this data, but also one all systems that have access to the local network. This also goes for any mobile devices your employees use to access the network. Staggeringly, Symantec reports that 66% of SMBs are unconcerned with external and internal cyber threats. Regarding the latter, it's important to lock down the devices that can access the network. If possible, block employees' personal devices from accessing the network. If that's not possible, then offer training on how to secure their devices, offer to pay for anti-virus apps for the devices, and seek ways to incorporate mobile devices into your access control scheme. Keep in mind that mobile devices can also be an effective way to get your employees back to work in the event of a disaster.

Assess Vulnerabilities

Next, it's important to assess your physical facilities and their



Carefully manage remote connections to limit your exposure to unknown users.



Use a firewall to whitelist appropriate apps and blacklist inappropriate apps.

vulnerability to various disasters. For instance, having backups regularly sent to an offsite facility is a good way to quickly recover from disasters, but if the offsite facility is just down the street, localized disasters such as severe weather, tornados, or hurricanes can wipe out both locations. Thus, it's a good idea to have redundant backups sent to a secure facility in a different part of the country, preferably with a wholly different climate than the one in which your business is located.

Speaking of backups, having a comprehensive data redundancy plan is vital. Aside from offsite backups, make sure there are also local backups. Because they're on site, you can update them more frequently to prevent outages in the event a single system or server fails. Server virtualization and cloud computing are both effective redundancy strategies you can deploy. It's also important to fre-

quently check the integrity of all backups. There are numerous services and products on the market designed to offer small business data backups; take the time to investigate these and select the one that best suits your needs.

From Worse To Worst

If you do all of the above, you will be sufficiently shielded against most disasters and prepared to handle periods of unexpected downtime. But getting back up to speed following a catastrophic event, such as a major fire or significant building damage caused by a particularly fierce storm can be more involved.

Even though you can't prevent these sorts of events from occurring, you can plan ahead to minimize their disruption on your day-to-day business. Start by making sure your insurance is up to date and sufficient to cover the costs of rebuilding. If necessary, add sup-

plemental policies to your coverage to make certain you are covered for any type of damages that may occur. This includes opting for coverage of things like flooding and other rare natural disasters; it's better to have too much coverage than not enough.

Another proactive step you can take is to set up service contracts ahead of time with local commercial repair and maintenance businesses, such as HVAC, plumbing, electrical, and communications service providers. Many of these organizations even offer discounts for contracted services.

What Disaster?

When a disaster occurs, those who are prepared for the worst will always come out ahead of those who chose to simply hope for the best. Taking the steps outlined in this article may make the difference between business as usual and going out of business. ●

More Possibilities, Less Hardware

Virtual PCs



This Windows 7 machine is running virtual “guest” instances of both Windows XP and Windows 8 on top of its “host” operating system.

Thinking about a virtual PC—that is, a computer running inside another computer—can be a little confusing, like thinking about thinking or writing about writing: Spending too long at it can result in head-spinning confusion.

What’s A Virtual PC?

A true virtual PC is an instance of a computer and its OS (operating system) running in (and using the memory and hard drive space of) a “host” computer even as the

host OS *also* runs. This is a bit different than simply running a different OS, Windows, for instance, on a computer originally designed to run Mac OS X. In the latter case, the computer is actually running the new OS and *only* the new OS; naturally, this configuration uses fewer resources (meaning less memory, mainly) than a virtual instance of one OS running while a different OS also runs. In *that* case, the host OS is running and translating commands on-the-

fly, so that the guest OS can run in a separate window, a “sandbox” of sorts dedicated to that OS.

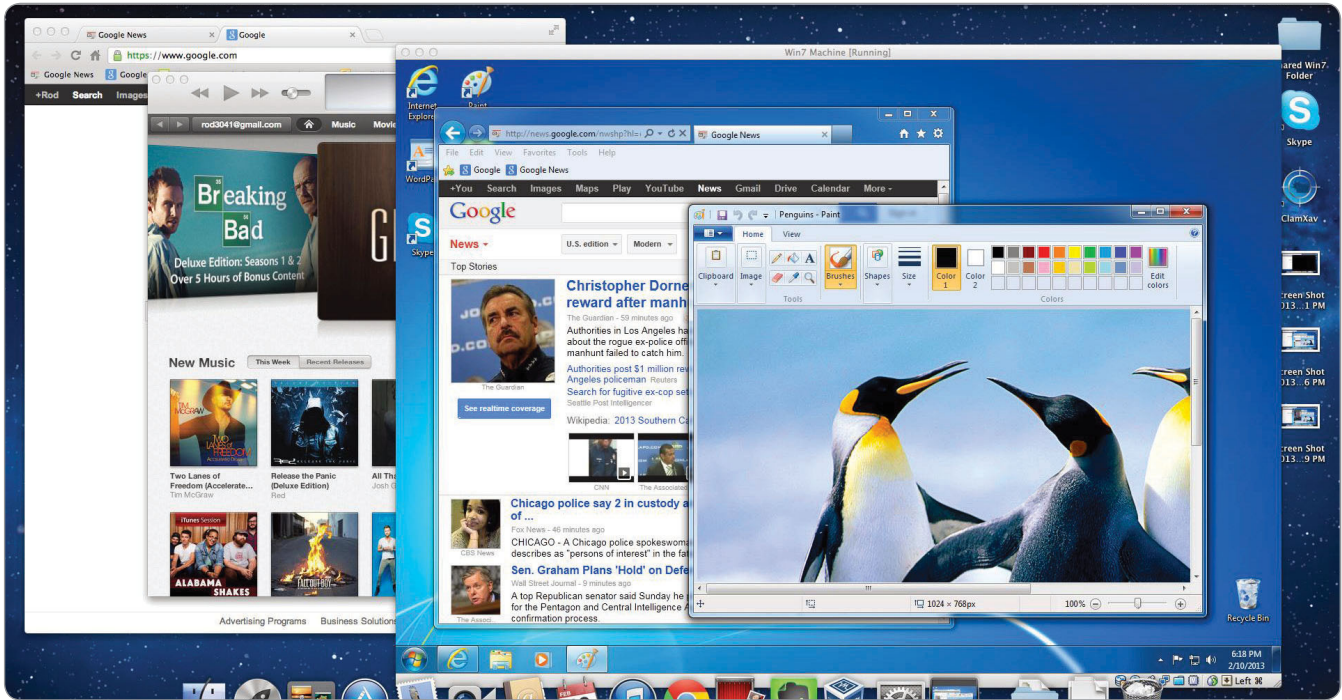
This means that you can use one computer to run multiple instances of multiple OSes, often side-by-side. With the right software, many Macs, for instance, can run Windows. And your Windows 7 machine can run Win7, XP, or Vista—or all three at the same time.

It’s even possible to “nest” virtual systems. Say you run an iMac, and you use a virtual PC application to have it run an instance of Windows 7 on your Mac. In Windows 7, you can then install and run a sub-instance (if you want to think of it that way) of Windows XP. For that matter, you could install another version of OS X within your virtual Windows system. (Ultimately, and possibly very quickly, you’ll max out your system’s memory and hard drive space. Long before that, though, you’ll probably give up, sidelined by a recursively-generated headache as you try to keep track of which OS is which.)

Why Run Virtual PCs?

But why bother? What do you gain by using virtual PCs?

Few of us can afford to run out and buy a new computer just so we can run or test a certain piece of software on it. Yet, it’s not unusual to need a Windows machine, for example, to view a particular piece of data in its native environment. Or to need another machine for someone to use to get some work done. With virtual PC software, if you’re short a Windows machine but have an extra Mac, you may be able to have that Mac



This Apple iMac is running a virtual instance of Windows 7. On the Mac side, you can see the Mac desktop icons, the Mac dock (at bottom) and Macintosh iTunes (at left). In the virtual Windows . . . er, window, you can see Windows versions of MS Paint and Internet Explorer.

run a virtual instance of Windows. (Yes, you'll need a legal copy of Windows in order to install and run it on the Mac.)

It's all about flexibility, really. If you need to run a particular piece of software on a specific OS, but you don't happen to have that OS running on a machine at your home or place of business, you can use one machine to mimic another.

Virtual Servers

At the office, the idea of running virtual systems becomes very compelling for a number of good reasons.

First, in a business environment, you're quite likely to have occasion to test software on multiple platforms, share data created on a different systems, or quickly come up with an extra machine that an employee can use to stay productive.

But the need for virtual systems in a business environment reaches its

apex when we think about servers and how they're used in businesses.

If you're like most small businesses, much of your server capacity remains unused or underutilized. Yet, you may find yourself needing additional servers for mail, social networking, messaging, hosting, data delivery, etc. If your current servers are underutilized, it makes little sense to add more physical servers to meet those needs. Instead, you can set up multiple "virtual servers" in one physical box. To your software (and to your customers or staff, if any have access), it looks as if you have multiple servers. And you do, but it happens that they all reside in one physical computer.

Not surprisingly, setting up and maintaining virtual servers requires software that's a good deal more complex (and more expensive) than that used to add virtual instances to a standalone machine. However, it's a very cost-effective way to add servers—much less expensive than

buying, setting up, deploying, and supporting more physical boxes.

Buying Virtual PC Software

For consumer-level software that's meant to add multiple-OS flexibility to a standalone system, you have multiple purchase options. There are excellent shareware and freeware virtualization packages out there. You can easily find them on the Internet, and the ones we've tried work quite well.

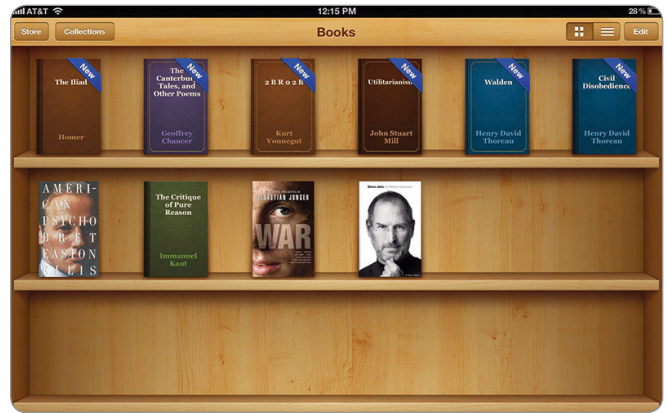
There are also commercial options, and these can be easier to install and use—and are often more elegant—than the freeware. They tend to offer more features, regular updates and bug fixes, and better technical support than one normally gets with freeware or shareware products. If you're a small business and have minimal (or no) IT staff, you're probably better off staying with a commercial package—It'll be easier to set up and use, and support is only a phone call away. ●

Pseudo-Realistic Interfaces

Skeuomorphic User Interface Design: The Good, The Bad, The Ugly



TurnPlay for iPad is an example of a skeuomorphic media player.



The shelf in iBook is a visual representation of a bookshelf.

PCs, tablets, and smartphones make our lives easier by providing digital ways of doing things that are often more efficient than the analog alternative. And for the most part, the interfaces found in our electronics reflect this concept. Communicating via email or text message is much faster than writing a letter—both in time spent writing and sending. Answering a question by using a search engine is typically much faster than how long it would take you to find the information in a book. That said, software designers sometimes create programs and apps that attempt to appear (and in some cases, function) like their analog predecessors. Here, we'll examine the positives and negatives of those so-called skeuomorphic user interfaces.

What Is A Skeuomorph?

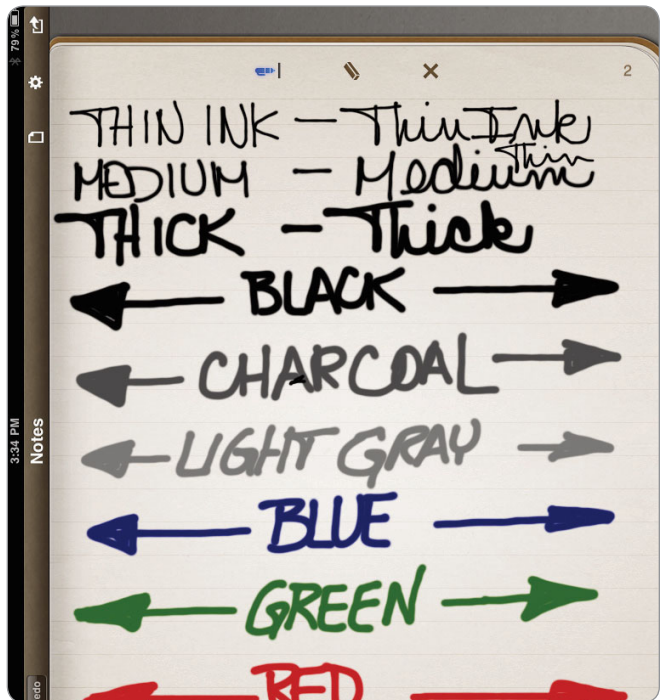
The Oxford Dictionaries site defines a skeuomorph as “an object or feature which imitates the design of a similar artifact made from another material.” When looked from the UI (user interface) point of view, a skeuomorphic application is one that emulates a look or behavior that you’d experience with a comparable object in the physical world. Calendar applications are one of the most popular examples of skeuomorphic designs: Most of them seem to include a rectangular replication of the week/day grid found on the paper calendars that we hang on our walls or stand on our desks. Some mobile calendar apps even feature a page-turning effect to make the calendar mimic a traditional calendar. Another common example would

be note-taking applications, many of which opt to copy the ruled-paper or sticky-note appearance that mimics a paper note.

Of course, not all skeuomorphic design elements are paper-based. Skeuomorphic audio- and video-editing programs typically include virtual “dials,” “buttons,” and “sliders” to let you change things like volume, input sources, and other items that would that you’d adjust on traditional equipment. In some cases, you’ll see many graphics that actually contribute nothing to the functionality of the program, such as the visual book binding found in some eReader apps or a leather-like texture in a mobile “wallet” app. Often these skeuomorphic elements can actually complicate a task that might have been more easily accomplished without the analog element, such as an app



Check out the threaded “stitching” along the top of the Find My Friends app.



Penultimate for iPad is a handwriting utility that offers a virtual notepad.

that uses an onscreen toggle “switch” where a button would have sufficed.

Why Add Skeuomorphic Design Elements?

Skeuomorphic concepts are added to an application because it helps make the interface feel familiar. For example, a recipe app that features onscreen “tabs” for various categories—such as you’d see in a cookbook—provides an instantly recognizable way to navigate the application. Sure, a user could just as easily type the name of a given dish into a search engine, but by adding the visual similarity, the app provides a digital interface that somehow feels the same as a traditional cookbook. Photo organization tools featuring a scrapbook or photo album analog are another app category that benefits from skeuomorphism: The design can immediately give someone an idea of how they are supposed to use the program, because it’s obvious to users

that they’ll want to flip through the images from left to right.

Another benefit of skeuomorphic design is that it is often more visually appealing than the alternative, which helps to further engage people. The graphic elements can also help give the program an interesting style, encouraging them to show the program to friends. Textures, borders, and other realistic elements can enhance the background and deliver visual cues, based on your knowledge of an existing object and of where other features are likely to appear. For instance, a contacts list in a smartphone may provide a Rolodex-type interface that allows one to scroll through lists of people with whom you can communicate.

The Downside Of Visual Metaphors

In some cases, a skeuomorphic design requires the user to take additional steps to achieve a task that could have been more easily accomplished with a simple gesture.

Take the average calendar application for instance, which generally requires you to press a button on the Month section to display the upcoming month’s schedule. Looking for something several months from now? You’ll need to scroll through each month, just like flipping the pages on a paper calendar. Might it be more efficient to integrate a search function or provide a scrolling list of appointments? Probably so. By sticking with a skeuomorphic metaphor, the designer may be limiting what can be accomplished—or the ease and speed with which it can be accomplished.

The visual metaphor can be even more annoying when the buttons, sliders, or other adjustment tools provide you with imprecise ways of setting a value. For example, consider an Internet radio application that provides a variety of equalization settings that can only be controlled through virtu-



The Game Center utility resembles a felt tabletop.



Thermo app uses a colored thermometer filled with blue “mercury” to display the temperature.

al dials that are difficult to adjust with any precision using a mouse. Such elements can also be distracting and confusing if the buttons or sliders *appear* as if they should do something, but in fact provide no functional purpose. They’re simply decoration, and such graphic elements may take up screen space that could have been used to offer other valuable features; this may be especially important on smartphones and other devices with limited screen real estate.

A skeuomorphic UI is something of a gamble, a bet the designer makes that the skeuomorphic reference will be understood by the

user. For instance, consider the traditional icons for audio (a siren alarm horn), video (a two-reel film camera), phone (a handset), and edit (a red pencil). Do these icons make sense to most of us? Yes, because we are still familiar with the objects they represent. However, you may not be able to say the same for upcoming generations (or for those from different cultures). Extremely dated skeuomorphic designs may actually confuse those who are not acquainted with the object. Remember, your children or grandchildren may never have seen a reel of film or a Rolodex. Have they ever touched a tele-

phone that *wasn’t* portable? Or seen one with a rotary dial? Visual interfaces that rely on such imagery run the risk of confusing users.

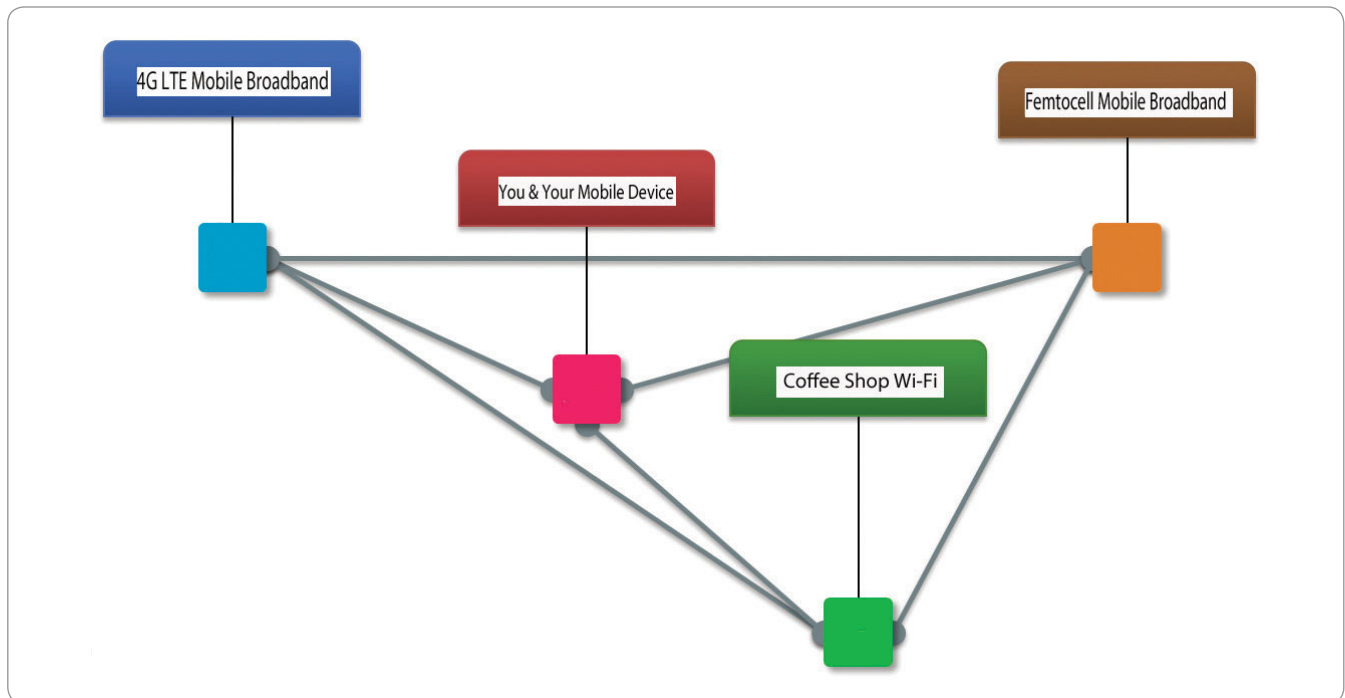
Skeuomorphics: Right Or Wrong?

Naturally, there’s no correct answer here, as a well-executed design of whatever type can only improve the usability of an application. Of course, a skeuomorphic interface that’s confusing, cluttered, outdated, or impractical can turn off customers—and there’s certainly no excuse for using analog-type visual elements that actually make it *harder* to use an application. ●

A skeuomorphic UI is something of a gamble: It’s a bet the designer makes that the skeuomorphic reference will be understood by the user.

Always On, Always Connected

The Promise of Universal Connectivity



With universal connectivity, the Internet access on your mobile device could seamlessly switch among several sources.

The growth of the Internet (and the ubiquity of Internet access) has significantly changed how we use our PCs and portable devices. In the beginning, we could only access the Web from a desktop PC. Laptops allowed us to take a device with us that provided occasional access to our key assets, assuming you were near a Wi-Fi hotspot or standard Ethernet plug-in. Now, we can carry a smartphone or other mobile broadband-enabled device for almost-constant access to our most important data, but speeds aren't consistent,

and some tasks may require Wi-Fi access. The future of Internet access lies in "universal connectivity," which essentially means that you'll have high-speed Web access on any computing device, no matter where you are.

With universal connectivity, there would be no need to sign into a Wi-Fi hotspot or be located within range of a given cellular network. Instead, you might subscribe to an authentication service, which could include both mobile broadband and Wi-Fi access points; that subscription would allow you to receive Web access from

any wireless signal supported by the unified service. And rather than logging into the various Wi-Fi hotspots or entering credentials for a mobile broadband signal, the various Internet access points will blend together. You could move from network-to-network—whether that consisted of Wi-Fi, 3G, 4G, or other mobile broadband deployments—with a seamless handoff between wireless protocols (i.e., no stopping to log in). Here, we'll examine when and how universal connectivity could come to you.



LTE Advanced promises even faster speeds than LTE mobile broadband.



Femtocell stations can add mobile broadband service to a small area.

LTE 4G

Reliable mobile broadband is the first part of the universal connectivity equation. The first generation of PDAs and smartphone were limited, in part thanks to mobile broadband speed and coverage constraints. Before 3G, mobile phone users generally dealt with download speeds that were comparable to dialup Internet. The introduction of 3G bumped data transmissions up to anywhere between 1Mbps and 4Mbps, or about two to five times as fast as dialup. 4G is now being rolled out around the world, and speeds are currently ranging anywhere from 3Mbps to 9Mbps.

These data rates are close to what we saw with early Wi-Fi standards.

4G LTE (long term evolution) is the current darling of mobile broadband technology, as most wireless companies and smartphone manufacturers are switching to LTE for mobile broadband. Note that some areas of the country may still be using WiMAX (Worldwide Interoperability for Microwave Access) for 3G and 4G access. WiMAX offers speeds comparable to LTE technology, but the technology was not widely adopted, and it requires different radio technology than LTE. LTE is backward-compatible with existing GSM (Global System for Mobiles)

and CDMA (Code Division Multiple Access) radio systems and networks, so LTE can provide a more seamless service across existing networks. As of January 2013, some 455 million people had access to commercial LTE networks.

LTE Advanced is expected to be the next step in the 4G evolution, and one of its key features is the ability to use non-continuous frequency ranges, such as femtocell base stations, that can be connected to a wireless company's existing network. Multiple carriers can also bond services together to provide peak data rates of 1Gbps. This new mobile broadband technology will go a long way to-

With universal connectivity, there would be no need to sign into a Wi-Fi hotspot or be located within range of a given cellular network.



In the future, all of your technology may always be on and always be connected to the Internet.

ward making universal connectivity possible, because it provides many features that allow constant, seamless Internet access.

Improve Coverage & Convenience

Femtocell stations, which operate like the cellular base station built into a cell tower (but which are limited to a much smaller area), may become a key aspect of universal connectivity. With a femtocell station, the range is generally similar to what you get with current Wi-Fi routers, and the idea is to increase signal quality in high-traffic locations and in areas where the landscape (such as a downtown area surrounded by tall buildings) may inhibit mobile broadband speeds.

In the past, businesses have opted to install femtocell technology to eliminate cellular dead spots within the office, so employees can enjoy improved coverage for voice and mobile broadband data to their

smartphones. Adding femtocells to provide a fixed cellular hub in key locations, such as in a mall or on main streets, can provide extra bandwidth for high-population centers. Alternatively, businesses may add high-speed femtocell stations to attract new customers, much like the many coffee shops and restaurants that today offer free Wi-Fi.

Smart Devices

The second part of the universal connectivity equation consists of connected devices that are intelligent enough to access the variety of mobile broadband and Wi-Fi connections available. The everywhere-Internet technology won't be limited to just smartphones, either. The idea is that almost every appliance in your home will have Web access, including things like your HDTV, DVR, heating and cooling system, and kitchen appliances. Want to heat or cool your house before you get back from a long vacation? Just use your

mobile device, which integrates with the various electronics in your house, to turn on your furnace or air conditioning. Have a couple of extra minutes and want to watch a show stored on your home's DVR? You'll be able to stream it to your mobile device.

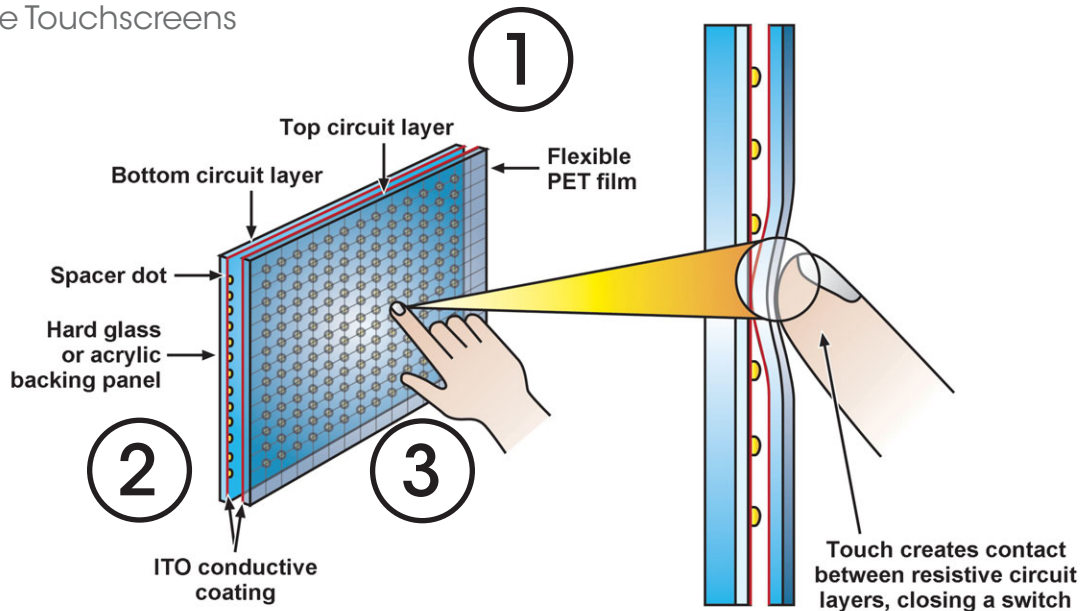
How Far Away?

The key to universal connectivity will be ensuring that all the devices and mobile broadband services are compatible with the same standards, so they'll be able to work with each other. As of right now, there are no clear paths to ensure that compatibility, but as the technology evolves, you'll be able to enjoy more and more Internet connectivity. Of course, there will also be a huge need for security, to ensure that only you (or other authorized users) are allowed to take control of the various devices. Until all of these factors reach maturity, the always-on, always-connected promise of the universal connectivity won't be able to fulfill its true potential. ●

Touchscreens

What Sorcery Is This?

Resistive Touchscreens



1 Resistive touchscreens feature multiple layers of transparent materials between the viewer and the device's display. The topmost layer is commonly composed of polyethylene terephthalate, called PET. This material is very thin and relatively flexible.

2 The underside of it is coated in a conductive ceramic called ITO (indium tin oxide). The next layer is a grid of spacer dots, followed by a hard glass or acrylic layer coated in the same ITO material.

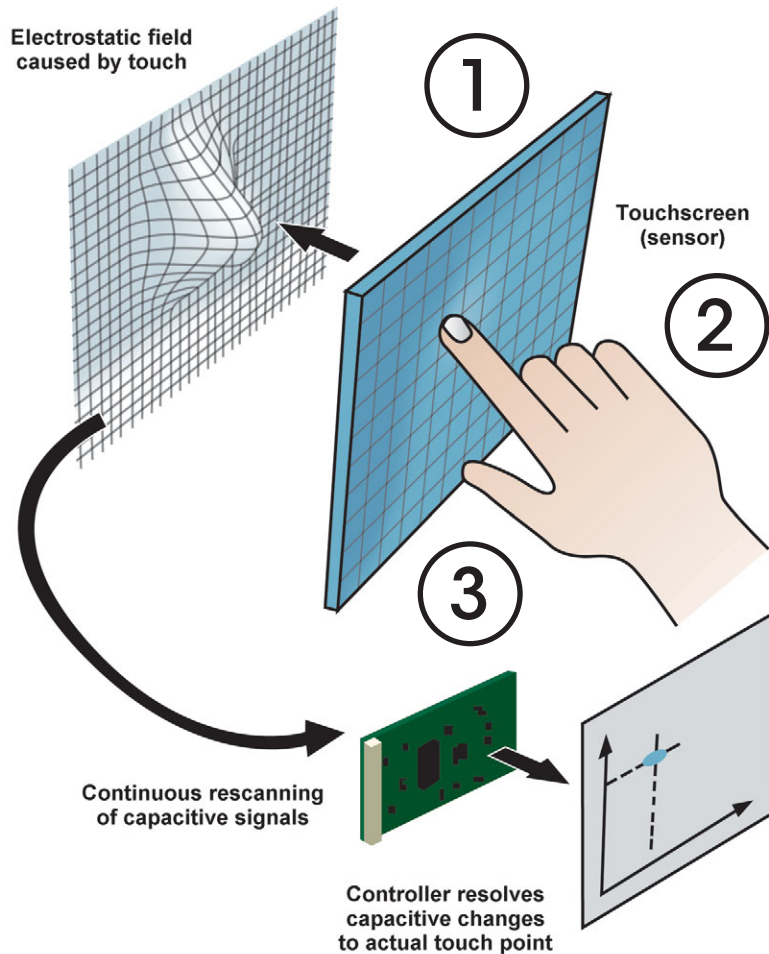
3 When your finger or a stylus touches the flexible PET layer, the pressure forces the two conductive layers to generate a point of resistance that is measured by a crisscrossing grid of electrodes, one series along the X coordinates of a layer of the conductive material and the other along the Y coordinates of the other conductive layer. This allows the system to determine the position of the finger or stylus.

The touchscreen is one of the cornerstone technologies used in modern consumer electronics, including smartphones, tablets, touchscreen laptops, and all-in-one desktops. But we use touchscreens for more than just games, apps, and phone calls; you use them at the grocery store's self-checkout lane,

to enter your PIN or to sign for your credit card at retail establishments, to get cash from bank ATMs, print out your boarding pass at the airport, get directions from a GPS device, at gas stations, car washes, and the list goes on. According to NPD DisplaySearch, the touchscreen module market was worth \$16 bil-

lion in revenue in 2012. By 2018, it'll be worth \$31.9 billion. There are half a dozen different touch technologies that have been employed in touchscreens, but they generally fall into one of two types: resistive and capacitive. In this article, we'll illustrate how the two very different technologies work.

Capacitive Touchscreens



1 Most capacitive touchscreens consist of a rigid outer layer followed by another two layers of conductive transparent material, often the same ITO used in resistive touchscreens, separated by a thin insulator.

2 Because the human body acts as a conductor, your finger generates slight changes in the capacitance between the layers, distorting the electrostatic field. Rows of very sensitive electrodes along the X and Y coordinates of the two layers communicate the exact position of the finger to the controller.

3 Capacitive touchscreens can detect multiple fingers by continually scanning the electrodes in rapid succession.

Resistive Touchscreens

Resistive touchscreens were popular in devices such as PDAs and early smartphones and tablets. They're durable and relatively inexpensive to manufacture, which makes them perfect for interactive interfaces in grocery stores, banks, airports and more. Another plus is that you can use a resistive-based touchscreen by applying pressure with your finger, a stylus, gloved finger, or other pointing device.

Capacitive Touchscreens

The somewhat more consumer electronic-friendly touch technol-

ogy, capacitive (or more specifically, *projected capacitance*), is also more expensive to manufacture. Benefits include better screen clarity, support for multiple points of simultaneous contact (multitouch), and a solid-state design. These screens are what most smartphones and tablets currently use.

Advancements are constantly increasing the responsiveness and clarity of capacitive touchscreens. One drawback to capacitive touchscreens is the fact that one cannot use them with gloves or non-capacitive instruments.

Capacitive touchscreen devices also employ special techniques

to limit false inputs. For instance, during a call, the screens of many smartphones will interpret touch input near the speaker as the user's ear, and shut off the screen. When you pull the phone away from your face, the screen comes back on and is ready to detect input again.

Screen Science

Today, touchscreens are appearing in almost every consumer electronic device category and every year they get more responsive and more capable. Touch is here to stay, and we're quickly approaching a time when touching a screen will become as basic an impulse as pushing a button. ●

The Web Of Things

What It Means For You & The Things You Use



The Web of Things lets countless everyday objects automatically share data with PCs, servers, mobile devices, and other machines.

The Web of Things (WoT) is a term used to describe the gadgetification of everyday objects, leading to a situation in which pretty much *everything* will be Internet-enabled and when all devices and appliances will be able to communicate with one another. Today, the WoT is more concept than reality, though we're quickly approaching a time when everything—from our home appliances to utility controls, automobiles and public transportation, healthcare devices, fitness devices, foodstuffs, and more—can connect to the Web and share information on your energy consumption, driving habits, home temperature fluctuations, local traffic,

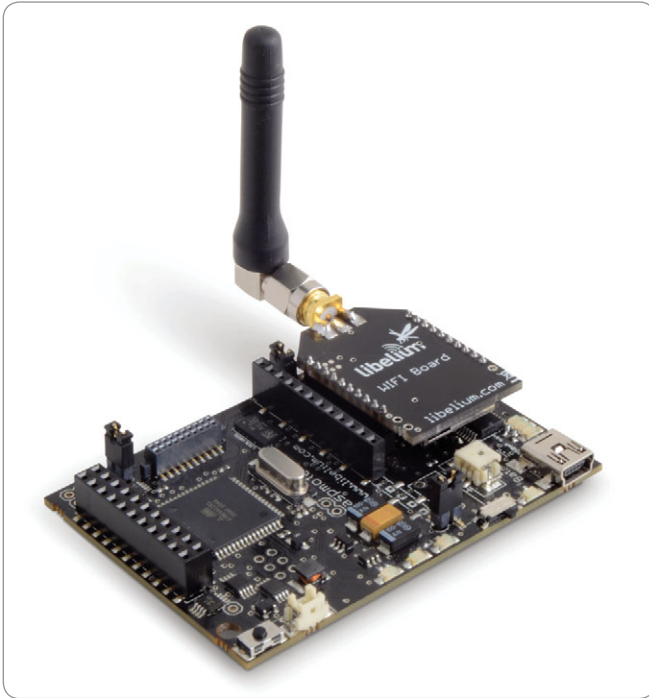
resting and peak heart rates, expiration dates, and countless other potentially useful nuggets of information.

The Non-Human Element

Separately, this data has limited usefulness, but when it's continually and automatically collected, cross-referenced, and uploaded, you can begin to see how businesses, utilities, governments, and consumers could all benefit greatly from such an interconnected ecosystem. One of the core concepts wrapped up in the WoT is the idea of Machine To Machine (M2M) communication, which refers to the ability of sensors and meters and other objects to

communicate their observations or readings to other devices, without human intervention.

To illustrate the WoT's usefulness in inventory management, consider that before it, people determined current inventory levels by physically looking at the products in a warehouse, and counting them one by one. This works fine as long as you don't have too many products, they're not sold and replaced too quickly, and they don't move far between where they're manufactured and where they're sold. But today, almost nothing is sold where it's manufactured; large organizations deal with millions of products, global distribution channels, and numerous



Sensors like this can enable an appliance or other object to transmit data to the Web.



Cars may soon come with their own “black boxes.” (Most of which are in fact red or orange, as it happens.)

warehouses. To manage inventories on this scale would take a small army of people who enjoy counting widgets all day, every day, pretty much forever. Not an appealing prospect, and one that's error-prone, to boot. Outfitting each product with an inexpensive location-aware smart sensor capable of transmitting and uploading its data unaided, for instance, lets companies track shipments at virtually any point between the factory and the eventual point of sale—and possibly beyond.

The WoT Possibilities

Inventory management, like the system described above, is one of the most practical applications of the WoT. Beyond manufacturing and retail, however, embedded devices are *already* adding Web connectivity to our televisions, major appliances, security systems, and homes through home automation systems to keep us comfortable, entertained, and safe. Smart cars can record your driving habits, allowing

insurance companies to offer more attractive rates to their best drivers. Some health-monitoring systems are capable of automatically uploading their data to the Web, so doctors can remotely monitor days' or weeks' worth of results, rather than rely on those from a single test taken when you come in for a checkup. As you can see, the WoT has the potential to improve your finances, health, and entertainment, and could positively impact your overall lifestyle.

On the downside, many are wary of what the WoT could mean for personal privacy. Having the products you use every day constantly broadcasting your habits and preferences to those intent on marketing their wares at you as often as possible is not a comforting thought for most of us. Is it okay for a potential employer to choose a supposedly healthier candidate over you because the employer had access to your fitness monitor data? Can an insurance company drop you simply because you speed

on a regular basis? These and many more questions have yet to be answered, but they will certainly arise as the WoT becomes a reality.

Perhaps even more important than the unsorted privacy issues, there's the potential that the future of the WoT will amount to little more than a multitude of disparate proprietary networks, all gathering data for the sole benefit of one or more organizations, all treated and protected as trade secrets.

The WoT Of Tomorrow

One thing's for sure: “Things” are becoming smarter, and as they collect information about their surroundings and about human activities, businesses will have to invest both time and money to store and interpret the massive volumes of automatically generated data. The shape of the Internet will shift, and the majority of traffic will eventually be dominated by machine interactions. One of the biggest challenges may be simply maintaining a say amidst all of the talking machines. ●

How To Buy

A Wireless Router

MIMO (multiple input, multiple output) technology uses multiple antennas to send and receive multiple signals simultaneously.



Setting up a wireless network in your home or office is practically a necessity when your PC, Mac, smartphone, tablet, printer, and TV all offer the ability to connect to the Web. Having everything networked together makes Web content readily available to each device, with the added benefit of simple file- and printer-sharing, audio/video streaming, and more. In this article we'll provide some buying advice for those who are new to wireless networking or just looking to replace their old wireless routers.

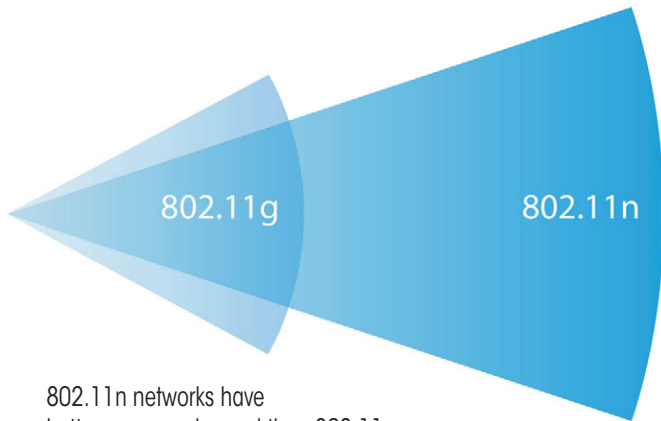
802.11 Alphabet Soup

Every wireless router typically supports a handful of wireless standards, the earliest of which was 802.11a/b, for ranges and speeds up to 115 feet and 54/11Mbps (megabits per second), respectively. Today's routers also support 802.11g and 802.11n. The latest standard, 802.11ac Draft (expected to be finalized in late 2012), supports the fastest speeds yet for consumer and business wireless routers, up to 866.7Mbps. Ranges on 802.11ac devices will likely be

less than 802.11n-based routers, but many of these routers will have the ability to switch to a 2.4GHz-based 802.11g frequency to maintain a connection to devices outside of the 5GHz frequency band's optimum range.

Range Rage

If you've ever bought a wireless router and found the actual range and the range listed on the box to be at odds, there's a reason for that. The ranges listed on the box are often based on best-case scenarios,



802.11n networks have better range and speed than 802.11g.



The WPS button streamlines the process of connecting Wi-Fi devices to your network.

Wireless Standard	Frequency	Max Data Rate (Per Stream)	Max Indoor Range
802.11a	5GHz	54Mbps	115 feet
802.11b	2.4GHz	11Mbps	115 feet
802.11g	2.4GHz	54Mbps	125 feet
802.11n	2.4GHz/5GHz	150Mbps	230 feet
802.11ac	5GHz	866.7Mbps	N/A

assuming few if any obstructions and zero interference. Your home or office is composed of various materials, some of which yield to wireless signals more easily than others. Other devices that use the same frequency can also cause interference, which cuts down on the effective range, as well. The best advice is simply to buy a router that has significantly more range than you think you need.

Don't Sweat The Old Stuff

One of the things Wi-Fi does quite well is allow for backward compatibility. For instance, routers that support 802.11g also let you connect aging 802.11b devices. If you do connect an older device however, the drawback is that everything else connected to the router drops back to 802.11b's maximum data rate of

11Mbps, regardless of each device's native Wi-Fi protocol. So when you're shopping, use the most common Wi-Fi protocol your devices support as a minimum requirement.

MIMO Info

MIMO (multiple input, multiple output) is a technology commonly found on wireless routers that uses multiple antennas to transmit and receive multiple data streams simultaneously. For this reason, you may find routers that are capable of higher data rates than are possible on a router capable of communicating only with a single stream. 802.11n routers are capable of supporting up to four MIMO data streams. 802.11ac Draft routers can support up to eight. If data rate is important to you, look for a wireless router with MIMO technology.

Protective Protocols

Securing your wireless network should be one of the first things you do when you set up the wireless network. Thankfully, most routers for sale today make it easy to encrypt your network using WPA2 (Wi-Fi Protected Access) security.

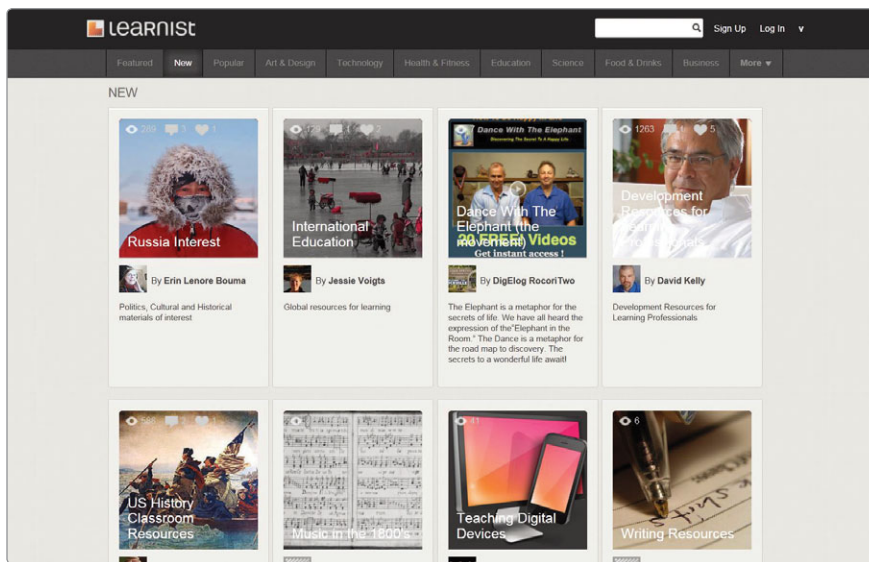
Many routers also support WPS (Wi-Fi Protected Setup), which is a multi-mode technology that makes connecting devices to your secured wireless network very simple. PIN Mode lets you input the PIN located on a sticker on the router to connect a WPS-capable device. Pushbutton Mode works lets you press a button on both the router and the device to set up the connection. NFC Mode requires that you bring the connecting device within close range of the router. USB mode lets you use a USB flash drive to transfer settings. Each technology ensures that you don't have to memorize a pass key, which makes connecting devices easy even for novice users.

Buy Better Wi-Fi

Buying a wireless router is like buying any other piece of technology: Make sure it has the power to handle what you do now, and a little extra to handle what you'll be doing a year or two from now. ●



Find It Online



Learnist
http://learni.st

This website is all about allowing you to learn and helping you teach new things to others. When you create a Learn Board, you can write about the topics you know best, as well as link to other sources of information found elsewhere on the Web, including videos, blogs, images, and documents. Those looking for information can simply type a query into the Search field at the top of the page. Just browsing? You'll be able to select from categories such as Art & Design, Technology, Health & Fitness, Education, Science, Food & Drinks, Business, and others.

Quartz
http://qz.com

Quartz is a news site that was created in 2012, and aimed at business people who want to read news on their mobile devices, as the website is designed mainly for viewing on tablets and smart-phones. In particular, Quartz covers stories about the new global economy. For example, current areas of coverage include the mobile Web, digital money, "energy shocks," modern states, and the next crisis. Stories are regularly updated and sources are noted in the article, so you'll be able to easily validate (and research more about) the topic. Correspondents and staff reporters are located around the world.

Manilla
www.manilla.com

Looking for a way to keep track of your finances? Manilla is a free online service that automatically gathers information about your bills and accounts, so you can view them all in one place. Manilla supports more than 3,500 service providers, including banks and credit card and cell phone companies. The service is compatible with frequent flyer reward programs, subscriptions, and daily deal services, as Manilla will alert you when miles are about to expire and when you'll need to renew a magazine subscription, among other critical updates. It also works with online coupons from Groupon and Living Social.

RebelMouse
www.rebelmouse.com

RebelMouse is a Web service that brings together your social media efforts, and it will pull in all of the past posts you've made through those channels. The result is a sort of aggregate home page

where people can sort the various posts by content category. Visitors will be able to see posts that they wouldn't otherwise be able to find because they'd be buried in the history of your blog or social media website. RebelMouse can link together your Facebook, Twitter, Instagram, Google+, Flickr, and Pinterest accounts, and you can also add blog content.

Blogger

www.blogger.com

Blogger is designed to simplify the blog publishing process. You won't need to know any code or have to own a server. It works by having you design and create the posts on your blog and submitting a form on the Blogger website. Blogger also provides you with access control, so you can open up your blog to everyone if you wish, create a private online blog for family and friends, or just keep it as a personal space to collect news, links, and ideas. Blogger will allow you to approve comments on a post-by-post basis, and you'll be able to delete comments you don't like.

Prezi

<http://prezi.com/>

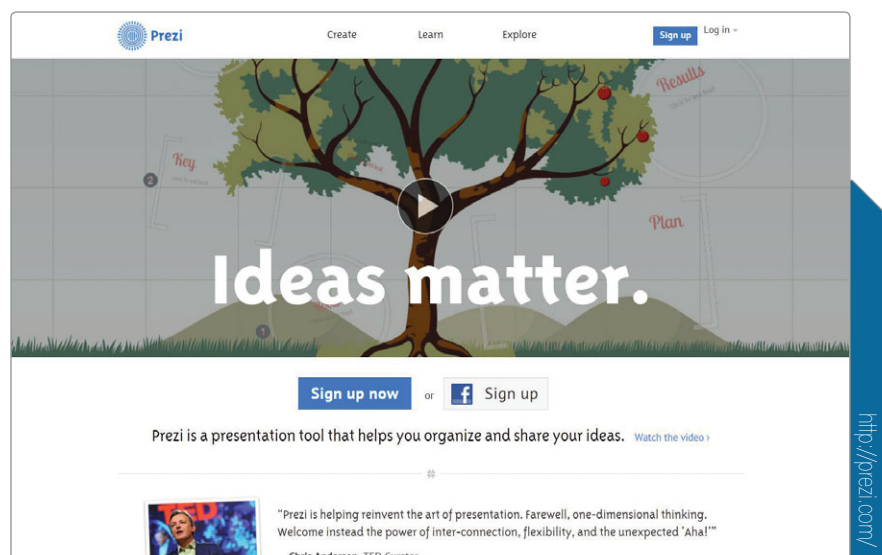
Prezi is an online presentation tool that gives you the freedom to save your presentation in the cloud, on a desktop or laptop, or on your iOS devices. To make it easy to share presentations with clients and colleagues, you can use the Prezi Meeting tool, which provides you with a virtual whiteboard for creating and presenting ideas. You can invite others to jointly view a presentation, no matter where they are, and people can co-present the slides. Prezi offers a dynamic, zooming canvas, so you're not stuck with static slides; instead, you can zoom out to view big-picture goals and zoom in to show the important details. ●



The Manilla website features a clean, modern design with a white background. At the top, the Manilla logo is prominently displayed, followed by navigation links for 'how it works', 'resources', and 'company'. The main headline reads 'Everything in your life, organized in ONE place.' Below this, a central image shows a laptop displaying various app interfaces. To the right, a box highlights the security features: 'Securely manage all your accounts: banks, credit cards, bills, rewards & more'. It lists three benefits: 'ONE login to access all your accounts', 'Automatic reminders mean no more late fees', and 'All your bills & statements automatically delivered'. A large orange button encourages users to 'SIGN UP NOW. IT'S FREE!'. The bottom section includes 'Manilla is Mobile' and 'Manilla is Secure' sections, each with a smartphone image and a padlock icon respectively. The footer features logos for Mashable, TODAY, The New York Times, USA TODAY, and Forbes.



The RebelMouse website has a blue header with the 'RebelMouse BETA' logo. The main section is titled 'Your Social Front Page' and features a cartoon mouse character holding a smartphone. A text box explains that RebelMouse organizes online presence into a beautiful, dynamic social site in minutes. To the right, there are buttons for 'Log In or Sign Up in Seconds' and social media sign-in options for Facebook, Twitter, Instagram, and Google+. Below this, a grid of testimonials from various users is displayed, including Ben Parr, Gary Vaynerchuk, Anand Giridharadas, Craig Newmark, EcoWatch, Robert Stephens, Mashable, TechCrunch, and Paul Carr. Each testimonial includes a quote and the user's name and social media handle.



The Prezi website features a large, stylized tree graphic with a play button in the center. The headline 'Ideas matter.' is prominently displayed. Below the tree, there are buttons for 'Sign up now' and 'Sign up' with a Facebook logo. A text box states: 'Prezi is a presentation tool that helps you organize and share your ideas. Watch the video >'. At the bottom, there is a quote from Chris Anderson, TED Curator, praising Prezi's role in reinventing the art of presentation.

SIGN UP TO RECEIVE THE DIGITAL EDITION . . . IT'S FREE



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Troubleshooting Reference: **COMPUTERS**



FEW THINGS ARE MORE FRUSTRATING than a computer that simply won't boot. When one of your primary means of communication, work, and entertainment is not functioning, it's not uncommon to feel isolated, unproductive, and bored. Here are a handful of tips to help get your PC booted and working again.

Start In Safe Mode

Assuming there's not a power issue (the PC is plugged in, turned on, and fans are spinning) then your boot up problem may be due to a faulty driver or other software conflict, which booting in Safe Mode can resolve. To do this, remove any device plugged into a

USB port, save your mouse and keyboard, empty your optical drive and then restart your computer. Press and hold the F8 key as the computer attempts to boot (prior to the Windows Logo showing up). On the Advanced Boot Options screen, select Safe Mode and press ENTER. If your computer boots up, then you know something driver-related is the problem, so take this opportunity to uninstall anything that might have become a problem, and then attempt to restart.

Restore Your System

To access System Restore on a PC that won't boot, you'll need a Windows 7 installation disc. With

your PC powered on, open the optical drive and put the disc in, and then close the drive tray. Restart your computer and then press any key when prompted to boot from the disc. You may need to change the boot options in the BIOS (Basic Input Output System) so that the PC boots from the optical drive first (press DELETE or F1 to access the BIOS during boot). When you see the Windows 7 Install Now option, click the Repair Your Computer option instead, from the bottom of the screen. Then just select the Windows installation you want to fix and follow the onscreen prompts to try the various system recovery options. ●

Prevention

The best way to avoid problems is to perform some regular maintenance on your system. Occasionally unplug your PC and take it outside to blow the dust off the vents, fans, power supply, graphics card, and CPU heatsink with a can of compressed air. This will keep you PC well-ventilated and reduce overall system temperatures. It'll also dramatically diminish the chances that your PC components will fail due to excessive heat.

Fix-It Checklist

It's helpful to have a few things on hand when your PC won't start. Here's a short checklist that'll help you solve the problem.

- ✓ The Windows installation disc you used to set up your computer
- ✓ Spare mouse and keyboard
- ✓ Another PC with an active Internet connection
- ✓ Driver discs that came with your components or PC
- ✓ Phillips-head screw driver
- ✓ Can of compressed air
- ✓ USB flash drive

Troubleshooting Reference:

TABLETS & SMARTPHONES



TABLETS AND SMARTPHONES ARE powerful little machines, but when they malfunctioning, all that productivity and entertainment comes to a halt. But don't fret; in most cases you can recover your devices with little effort. Simply follow these basic troubleshooting tips to get your shiny slab of glass back in working order.

The Tablet Is Frozen

Your tablet or smartphone might freeze or hang for a variety of reasons, from a faulty app to a dearth of available memory. Before you can determine what caused the problem, however, you need to regain control of it. If you're using an iOS-based device, then the first thing you should do is press

and hold the Sleep/Wake button until you see the Slide To Power Off slider, then swipe it to shut it down. If that fails, press the Sleep/Wake button and the Home button simultaneously until you see the screen go dark and display an Apple logo.

For most Android-based smartphones and tablets, a normal shut down procedure involves pressing and holding the power button and then tapping the shutdown option that pops up onscreen. If you don't see a shutdown option, you can force the operation by continuing to press and hold the power button until the unit shuts down or restarts.

Some Android tablets, including the Motorola Xoom, require a slightly dif-

ferent procedure. To perform a soft reset on a Xoom, press the power button and the Volume Up key simultaneously until the unit shuts off. Consult your manual for the proper procedures.

One Or More Apps Have Disappeared

Apps are the smartphone and tablet's best assets, but if you're ever unable to find one of your favorites, it might be because your device recently installed an operating system update that is incompatible with the app version you had previously installed. But don't worry, simply return to the App Store (iOS) or Google Play (or other Android app source) and reinstall the missing app. ●

Prevention

The best way to avoid problems with your mobile device is to perform some regular maintenance on it. Start by always keeping your tablet and smartphone charged, which ensures it has enough juice to install updates when necessary. Keep at least 30MB or more of the internal memory free at all times. If you get a low memory warning, that's a good indication that you need to start deleting some apps or backing up photos and videos to your PC.

Fix-It Checklist

It's helpful to have a few things on hand when your tablet won't start. Here's a short checklist that'll help you solve the problem.

- ✓ USB charging cable
- ✓ Power adapter
- ✓ Active Wi-Fi connection
- ✓ Tablet or smartphone owner's manual
- ✓ Dry non-abrasive screen-cleaning cloth
- ✓ Spare SD card or microSD card for compatible devices

Troubleshooting Reference: **MONITORS**



IT DOESN'T MATTER HOW MUCH WORK you need to do or how capable your PC is, if your monitor is faltering or malfunctioning, then nothing gets done until the window into your PC gets fixed. Most monitor problems don't require professional service; you can address them yourself. Follow these basic troubleshooting tips to see clearly again.

The Monitor Screen Is Dark

First, check to make sure you've pressed the power button on the monitor, that the monitor is plugged into a working outlet, and that there is no on/off switch on the back of the monitor that has been switched to the Off position. If you see a lit LED

(commonly amber or yellow), but the screen is still dark, then it's possible that the monitor is not receiving a signal from the PC. Try pressing the Input or Source button (if present) multiple times to cycle through the various source types. Make sure the display cable is attached to the back of the monitor and the associated port on the PC tower. Tighten any loose connections. To ensure that the monitor is the problem and not the PC (or the graphics adapter in the PC), try plugging in a monitor that you know is working properly, making sure to use that monitor's cable. If it works, then try swapping cables. If none of the above work, you may need to replace your monitor or get it repaired.

Problems With Color, Brightness, Contrast, & More

If the contrast, brightness, sharpness or another setting on your monitor is affecting the display, then you should consult your monitor's user manual to determine how to access the OSD (On-Screen Display) menu. The manual should include instructions for adjusting color settings, contrast, brightness, and other settings. If fiddling with the OSD doesn't help, and you're seeing color distortion, check the ports on the monitor cable for bent pins. If you don't see any or can't repair them yourself, try a different monitor data cable. If the problem persists you may need to repair or replace the monitor. ●

Prevention

The best way to avoid problems is to perform some regular maintenance on your monitor. Because there are no moving parts on your monitor, dust and heat are going to be the focus of your preemptive attention. Use a can of compressed air to clear vents (while the monitor is off) and make sure the monitor is not exposed to direct sunlight or excessive temperatures.

Fix-It Checklist

It's helpful to have a few things on hand when your monitor is malfunctioning. Here's a short checklist that'll help you solve the problem.

- ✓ Power strip or surge protector plugged into a working outlet
- ✓ Can of compressed air to dust off vents
- ✓ Monitor user manual
- ✓ Spare monitor data and power cables
- ✓ Spare monitor

Troubleshooting Reference: **PRINTERS**



FOR MANY SMALL BUSINESSES, THE printer is a vital cog in the machine; when it goes down, productivity suffers and some important work effectively stops. But before you call in a professional, try to fix the problem yourself. You can do it by following these simple troubleshooting tips.

When In Doubt, Check The LCD

Most printers feature some sort of LCD display that reports that status of ink cartridges, toner, and most importantly, any error messages you should be aware of. It's a good idea to periodically glance at the display, but make it your first stop if you run into problems. Often you'll find errors and

messages displayed here that give you specific instruction for how to solve the issue. Some common LCD messages include "drum error" (remove and replace the drum), "jam" (paper jam), and the self-explanatory "low ink" or "low toner."

Printer Fails To Print

If the printer stops printing, start by making sure the unit has power and is turned on. Allow enough time to pass to account for the warm up period (if your printer requires one). If the printer is new, make sure any packing material, tape, and protective plastic has been removed from the unit. Check that the drum, toner cartridge, or ink cartridges are in

their proper places and the compartments that provide access to the inner part of the printer are closed. Make sure there's plenty of printer paper in the tray(s).

If the printer is connected via USB or Ethernet, make sure the cable spanning the two devices is securely connected. If the printer is connected wirelessly, make sure it can detect the wireless network and that the printer and PCs on the network can communicate.

If your printer supports it, it might help to try an alternate connection method. For instance, connect a Wi-Fi-connected printer to your PC using a USB cable instead, and then retry the print operation. ●

Prevention

The best way to avoid problems is to perform some regular maintenance on your printer. Every time you replace the toner or ink, take a moment to inspect the unit, remove the paper trays, and wipe it down with a clean, dry cloth. Don't regularly exceed the recommended duty cycle for your printer. Replace the ink and toner cartridges exactly as described in the printer's manual and only use the ink, toner, and paper recommended for your device.

Fix-It Checklist

It's helpful to have a few things on hand when your printer goes on the fritz. Here's a short checklist that'll help you solve the problem.

- ✓ Printer's user manual
- ✓ USB cable
- ✓ Working Wi-Fi connection
- ✓ PC with an active Internet connection
- ✓ Driver disc that came with your printer
- ✓ Replacement ink or toner cartridge(s)
- ✓ Paper for printing test pages

Troubleshooting Reference:

INTERNET CONNECTION



THE INTERNET IS THE LIFEblood OF THE modern computing experience. Without it, your software remains static, unpatched, and vulnerable; you can't communicate or transfer files; nor can you contact remote customers, clients, and coworkers. But before you give up and move to the shores of Walden Pond, try these troubleshooting tips to get back online.

Can't Load A Web Page

There can be many causes for a faulty Internet connection. Start by launching your browser, typing www.microsoft.com into the address bar, and pressing ENTER. You can also navigate to other known sites: If those sites load properly, then the site that failed

to display may be temporarily offline, so just try back later.

Next launch the Network Diagnostics tool. The easiest way to do this is to launch Internet Explorer and click the Diagnose Connection Problems button when it fails to bring up your home page.

If the problem persists, reset your modem and router. Start by removing the power plugs from the back sides both devices. Next, plug in the modem and wait for the lights to come on (typically ten to twenty seconds), then plug in the router. Some modems have battery backups, so you may need to reset yours by pressing a recessed button on the unit. Make sure all Ethernet

cables between your PC, modem, and router are secure, and then relaunch your browser to see if the problem is fixed.

If not, delete your browsing history. In Internet Explorer, click Tools (press ALT if you don't see the Menu bar), click Delete Browsing History, and then click the Delete buttons for Temporary Internet Files, History, and Form Data.

You can determine if the malfunction is due to a faulty add-on by running Internet Explorer without add-ons. Click Start, All Programs, Accessories, System Tools, and then click Internet Explorer (No Add-ons). Not running IE? Other browsers should offer similar functionality. ●

Prevention

The best way to avoid problems with your Internet connection is to keep up with updates to your operating system and internet browsers. Click Start, Control Panel, System And Security, Windows Update, and then click Check For Updates from the left pane.

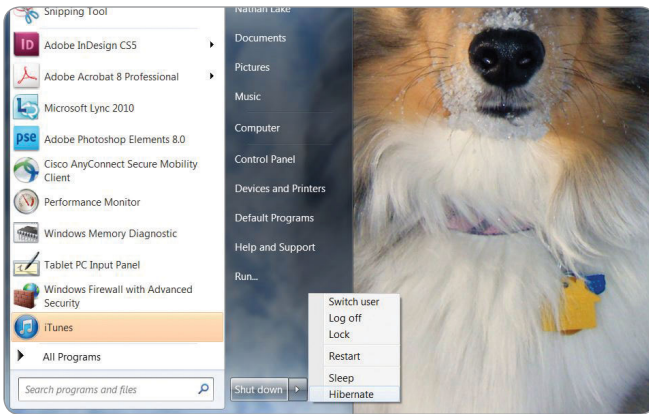
Fix-It Checklist

It's helpful to have a few things on hand when your Internet connection stops working. Here's a short checklist that'll help you solve the problem.

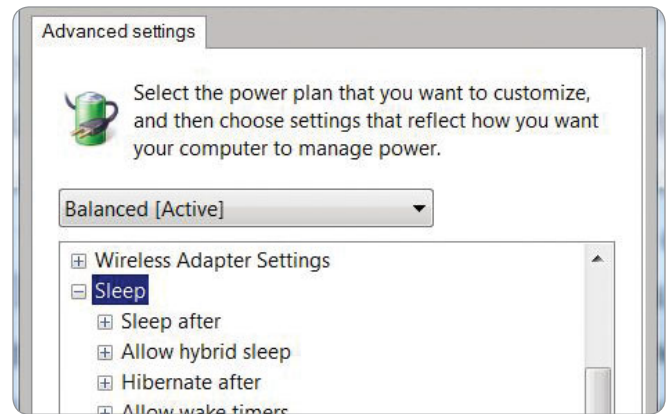
- ✓ A spare computer on your network
- ✓ Phone number for your Internet service provider
- ✓ Manuals for your router and modem
- ✓ Phone
- ✓ Spare Ethernet cables

Tips From The Help Desk

Common Tech Questions



When powering down a PC that runs Windows 7, you can choose from Sleep, Hibernate, and Shut Down.



You can configure the idle time before your PC will automatically go into Sleep and Hibernate modes.

Q: The Power menu in Windows 7 and Windows 8 offers options for Sleep, Hibernate, and Shut Down. What's the difference between them?

A: The Sleep and Hibernate modes are similar—both save the state of your open programs so that you'll have quick access to the files and programs you were using before you powered down the system. In Sleep Mode, all of the information is saved to the memory in your system, and the PC uses only enough energy to supply power to that memory. With Hibernate, information about your open applications

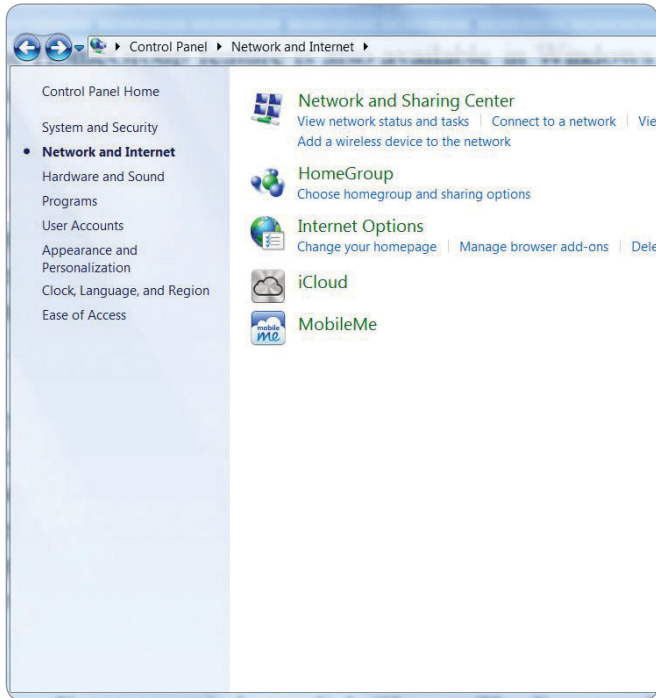
and files is saved on the computer's internal storage. The advantage of using Hibernate is that no power is necessary to keep the data on hand. However, Sleep mode offers a faster restart, often only a matter of seconds, compared to the Hibernate mode. Use Sleep mode when you plan on using the PC again in a short period of time. Hibernate is best for when you won't be using the computer for an hour or more. Shut Down will close all of your applications and completely turn off power to the computer. This is the ideal mode for those who want a hard restart when they start their PC, which can be a good way to avoid bugs

and memory leaks. You'll also want to select this mode after a program or Windows has installed updates and instructs you to reboot before the changes can go into effect. Of the three options, turning the computer on from Shut Down will take the longest time.

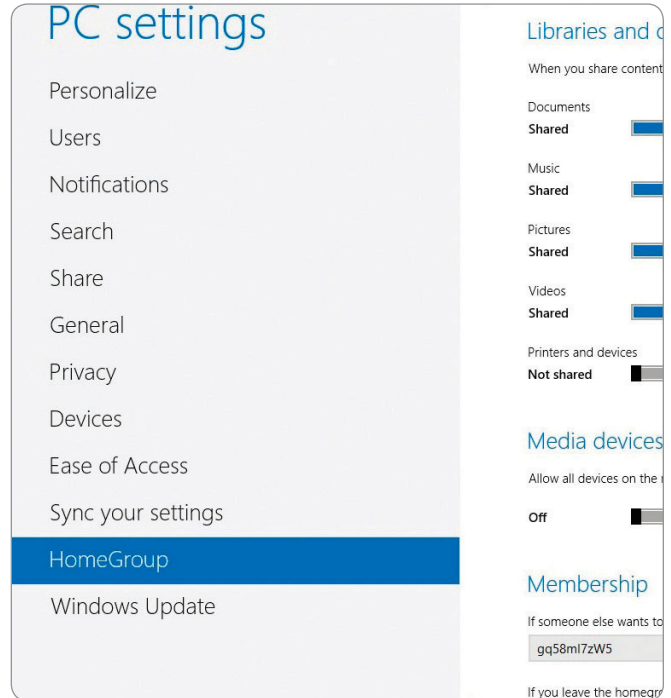
Q: What is a HomeGroup and why would I want to create one?

A: HomeGroup was introduced in Windows 7 as a way to simplify the process of sharing images, songs, movies, documents, and printers with other PCs on your home

The advantage of using Hibernate is that no power is necessary to keep the data on hand. However, Sleep mode offers a faster restart, often only a matter of seconds, compared to the Hibernate mode.



The HomeGroup settings in Windows 7 can be found in the Network And Internet section of Control Panel.



In Windows 8, it's very easy to configure the files you want to share in the HomeGroup.

network. With HomeGroup, you no longer need to search the network and choose a PC to remotely access the files. The HomeGroup feature is also available in Windows 8, and it's possible for Win7- and Win8-based PCs to join the same HomeGroup. In short, shared content from all of your Win7 and Win8 computers can be found in the HomeGroup.

Microsoft has made the sharing process fairly effortless. By default, the HomeGroup will include the files located in the Pictures, Music, Videos, and Documents folders found in your User Profile. If you store your personal files in those folders, you won't have to bother manually adding any files to share them with the other computers on your network.

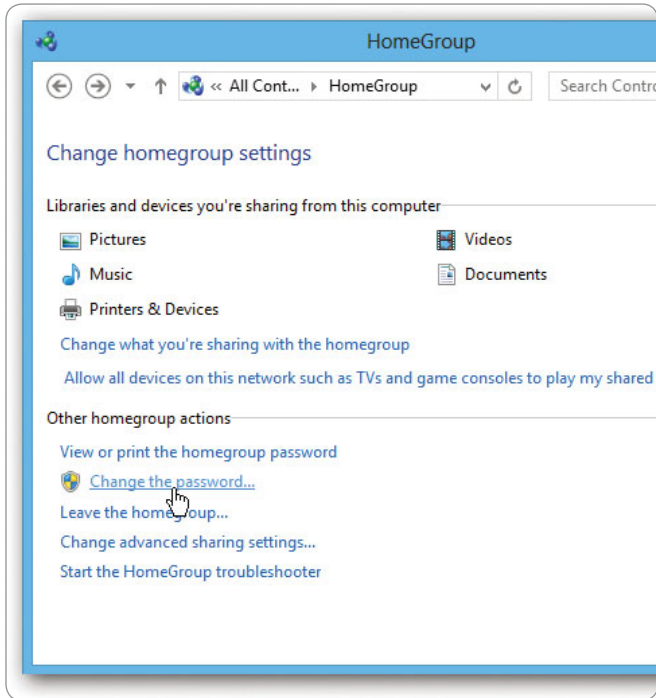
To set up a HomeGroup in Win7, click the Start button, select Control Panel, choose Network And Internet, and click HomeGroup. Click Create A Homegroup under Share With Other Home Computers Running Windows 7. Next, you'll see

options for Pictures, Music, Videos, Printers, and Documents. Select the content you want to share and Win7 will generate a password for the HomeGroup. The initial password is a random group of letters and numbers, but you can change the password to one that you and your friends can remember. To do so, open the Network And Sharing Center, select Choose HomeGroup And Sharing Settings. Select Change Advanced Settings and click Change The Password. At the Changing The Homegroup Password Will Disconnect Everyone dialog, click Change The Password. Win7 will display another long, complex password, but you can delete that and enter one of your choosing. If other Win7 PCs have already joined the HomeGroup, you'll need to inform the users of the new password.

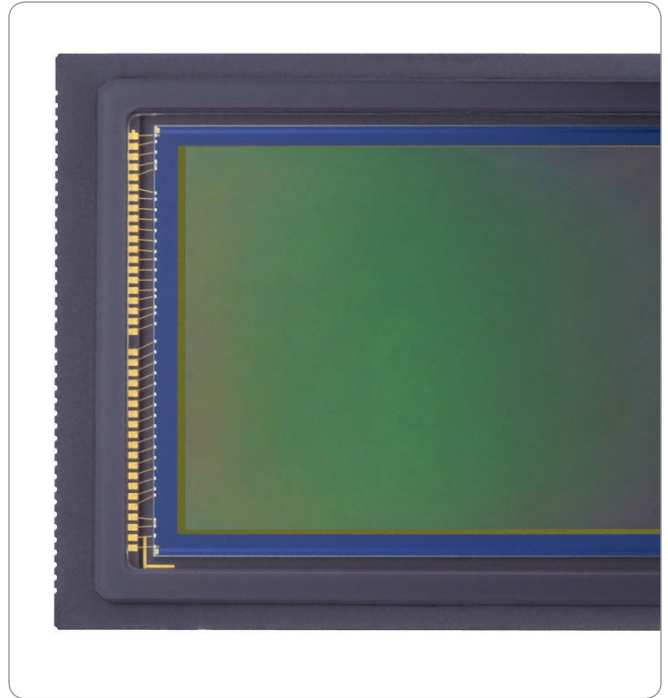
To create a HomeGroup in Win8, use the keyboard shortcut WIN-I (hold down the Windows and "I" keys) and select Change PC Set-

tings. Select the HomeGroup tab, and you'll be able to toggle on and off the files and devices you want to share. If a HomeGroup has already been created, you can enter the password into the Membership field. If you want to start a HomeGroup on a Win8 machine, copy and paste the password, so you'll be able to use it on other computers where you want to share files. If you want to make the password something easy to remember, press the WIN-W keys to bring up the Settings Search box. Type **network and sharing** and select the Network And Sharing Center. Select HomeGroup and click Change The Password, which can be found under Other Home Group Actions. Follow the on-screen instructions to change the password.

In terms of the content you share, just select the checkboxes for types of files you want to share, assuming that your files are stored in the Pictures, Music, Videos, and



You can change the HomeGroup password so that it's easier to remember when adding new PCs to the group.



In a digital camera, the CMOS is one type of image sensor used to collect light and convert it into an image.

Documents folder libraries. To add files, open Windows Explorer, right-click the item (whether it's a folder or one or more individual files), click the Share With button, and select HomeGroup (Read) or HomeGroup (Read/Write). The Read option only allows users to open the file, while the Read/Write option also lets them modify or delete the file.

Q: When shopping for a digital camera, I often see the term "CMOS" listed next to the camera's megapixel rating. What does it mean? Is it an important criterion?

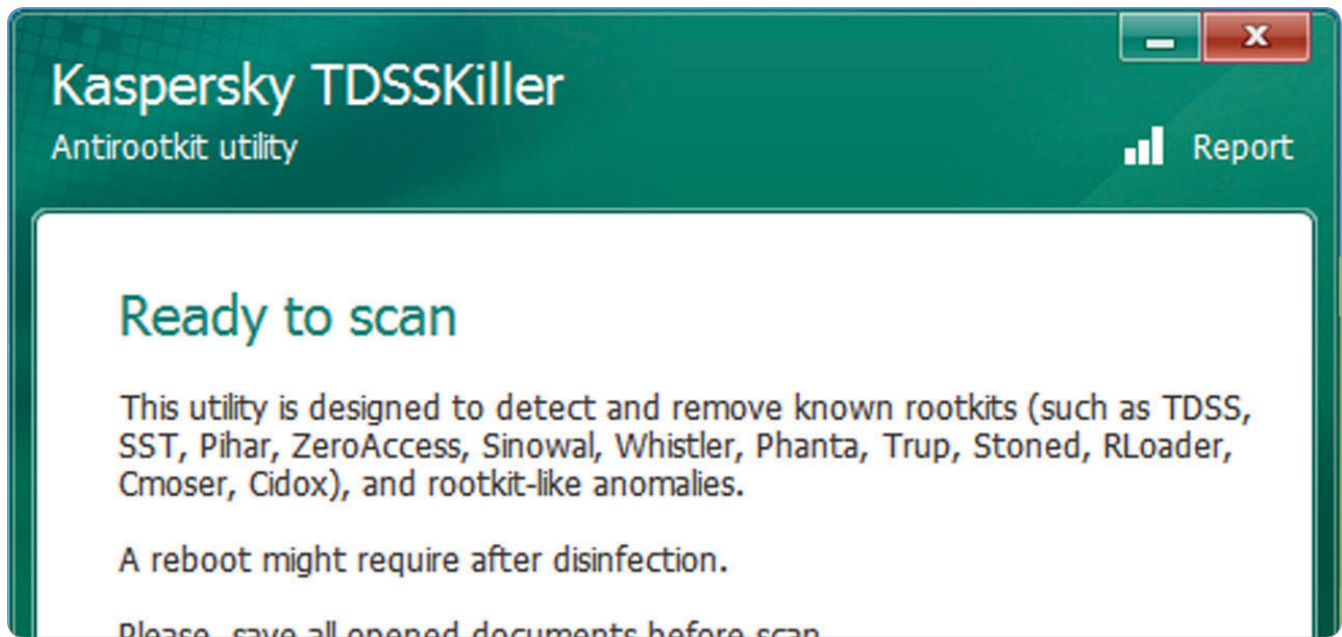
A: The CMOS (complementary metal-oxide semiconductor) is the digital camera's image sensor; it's responsible for converting light collected by a lens into an electronic signal. A CMOS sensor does a better job of collecting light than a less expensive CCD (charge-coupled device) sensor, which is why it may be touted on the camera's spec sheet. Covered with light-sensitive picture elements (pixels) the CMOS collects data from every pixel and forms the information into a digital image. The number of pixels on the CMOS equates to the megapixel rating of the digital camera—but there's more to a CMOS sensor

than its pixel count. The physical size of the CMOS can affect the quality of your images. If two cameras had the same megapixel rating but different size CMOS sensors, the camera with the larger CMOS (all other things being equal) would take the better picture. The larger CMOS can capture more light than the smaller one, resulting in images that display truer color and less grain. Also, a camera with a larger CMOS would perform better in low-light situations, and the greater light-capturing ability of the larger CMOS would allow the camera to produce darker darks and brighter whites. ●

If two cameras had the same megapixel rating but different size CMOS sensors, the camera with the larger CMOS (all other things being equal) would take the better picture.

Get Rid Of Rootkits

How To Handle Some Of The Trickiest Malware Around



Kaspersky's TDSSKiller is an easy-to-use utility you can download for free to remove most rootkits from your PC.

Rootkits are like malware with a survival instinct. Once your system becomes infected with a rootkit, it's often tough to detect the malicious software's presence and even more difficult to remove it. According to the Q4 2012 Kindsight Security Labs Malware Report, 6% of home networks had high-level infections, of which rootkits accounted for a sizeable chunk. In this article, we'll explain how to tell if your

system has a rootkit installed on it and how to remove it completely.

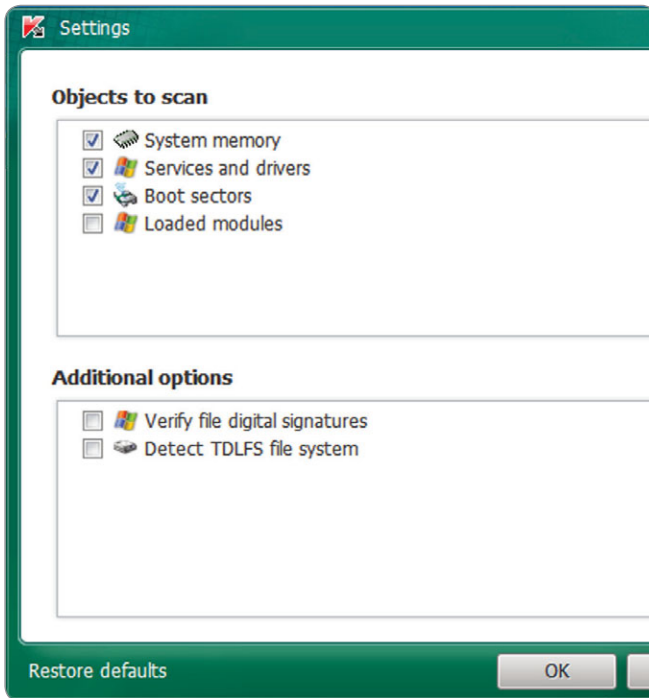
The Sneakiest Software

The term "rootkit" is a broad one that can refer to many different malware types, such as Trojans, keyloggers, and viruses. The feature that distinguishes them is the rootkit's ability to grant itself administrator access to the system, which it can then use for a variety of purposes, such as hiding

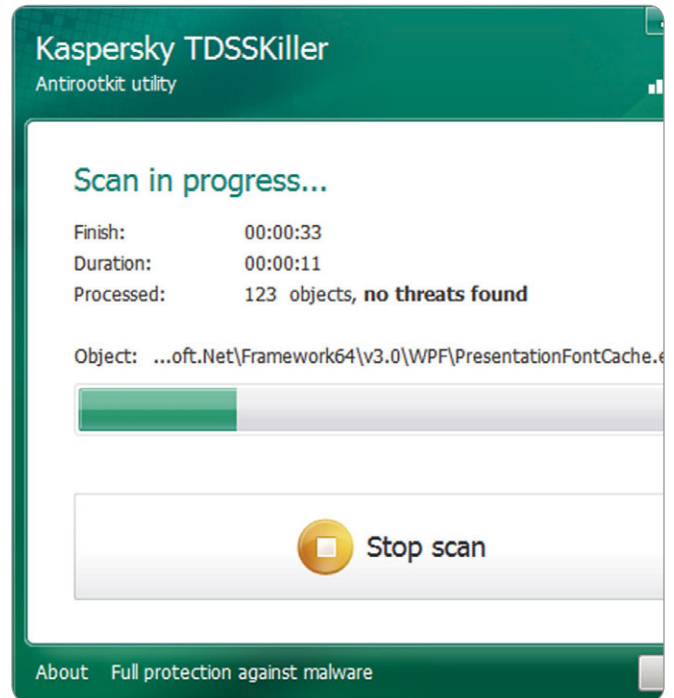
malware, granting outside users back-door access to the infected computer, preventing antivirus or anti-malware software from detecting the malicious software or from running altogether, turning the infected PC into a zombie in a botnet, and more.

One of the primary reasons rootkits can do all of these nasty things is because of where they plant themselves: typically in the operating system's kernel, the core bit of

According to the Q4 2012 Kindsight Security Labs Malware Report, 6% of home networks had high-level infections, of which rootkits accounted for a sizeable chunk.



The Settings screen lets you include other locations not covered by the default scan, including Loaded Modules.



Once the scan begins, it should conclude in less than a minute and display a list of found threats.

code that interacts directly with such hardware as the CPU, memory, and other devices. Rootkits have been known to take up residence in system memory and boot sectors, and can even disguise themselves as trusted services and modules.

Rootkits have a (well-earned) bad reputation; however, they also have practical uses. In some cases, users even install them willingly. Some rootkits have been used to enforce DRM (Digital Rights Management) protection, usually without the users consent. Those intent on pirating copyrighted media sometimes fight fire with fire by installing a specialized rootkit designed to *circumvent*

the DRM. Other rootkits are designed to eliminate cheating in online video games, and some anti-theft applications use rootkits to hide themselves so that you can remotely wipe your computer's hard drive if it's stolen.

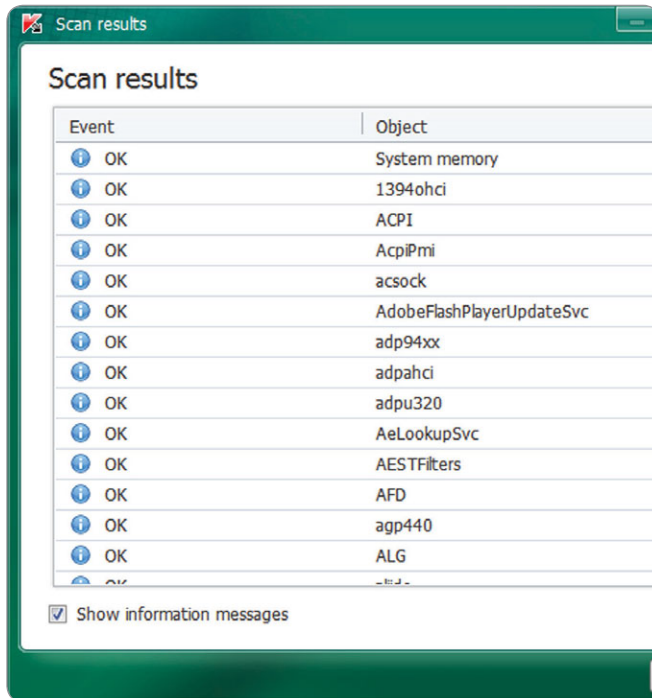
Routing Rootkits

The process of removing a rootkit can vary, depending on how the malicious software has affected your computer. In many cases, you only learn of the rootkit's existence after the infection has made itself obvious, perhaps by blocking your antivirus software or by preventing you from installing software or otherwise using your computer as you had intended.

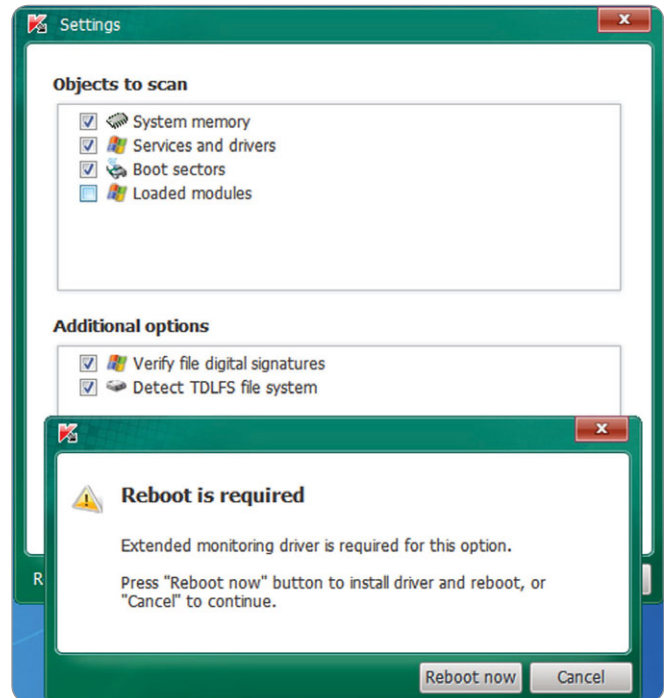
If you still have the capability (and you may not, because many rootkits disallow the creation of backups), the first thing you should do is make a backup of your important data or possibly a complete system backup. Because rootkits dwell at the kernel level of your system, removing them can involve editing sensitive configuration files, and any slipup can result in an unbootable system.

The next step is to obtain an anti-rootkit utility and install it on the infected system. In many cases, antivirus software is unable to remove rootkits, but installing anything may be difficult because of the aforementioned download and installation

Installing anything may be difficult because of the aforementioned download and installation restrictions that some of the more nefarious rootkits put in place.



Click the Show Information Messages checkbox to view the aspects of your system that checked out.



To run a scan of the Loaded Modules, you'll need to enable the option from the settings and then let the system install the driver and reboot.

restrictions that some of the more nefarious rootkits put in place. Often you'll need a second (uninfected) computer capable of downloading the rootkit removal executable file. One of our favorite rootkit routing utilities is TDSSKiller, from Kaspersky Labs. To download this utility, visit tinyurl.com/atll8zg and click Save.

Copy the downloaded utility to a USB flash drive and transfer the file to the infected computer's Desktop. If necessary, restart the computer in Safe Mode, keeping in mind that TDSSKiller can be run in Normal and Safe Modes. To get into Safe Mode, restart your computer and start pressing F8 as the computer restarts. On the Windows Advanced Options Menu screen, use the arrow keys to highlight Safe Mode and press ENTER. Select your operating system (if prompted), press ENTER, log in, and then click Yes on the Windows Is Running In Safe Mode dialog box.

Once the rootkit remover is on the Desktop, double-click it to run it,

then click the Start Scan button. You can also click the Change Parameters hyperlink on the main screen of the TDSSKiller utility to modify scanning settings. This menu will display checkboxes you can select to scan in various locations, including System Memory, Services And Drivers, Boot Sectors, and Loaded Modules. The first three options are selected by default, but if you choose the fourth, you'll need to install an extended monitoring driver and reboot the system to run the scan. If you click this checkbox, just click the Reboot Now button to install the driver, reboot the system, and begin the scan. The TDSSKiller's Settings screen also lets you configure the software to verify the digital signatures of files and detect TDLFS file system; the latter refers to a kind of rootkit that encrypts and hides its files on a portion of the hard drive that is not normally scanned.

When the scan completes, the utility will display a list of the rootkits it found on your system, typically giving

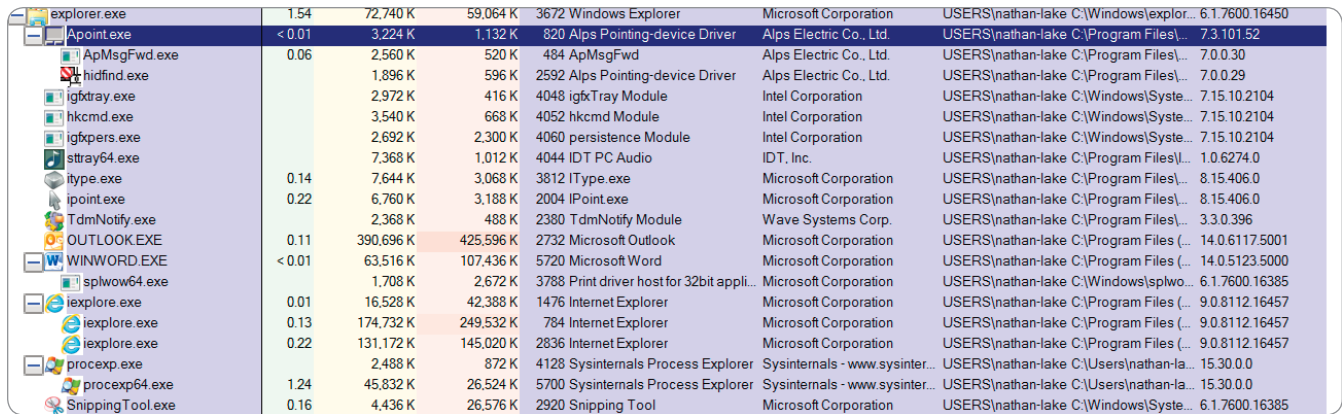
you the option to remove or quarantine them. You may need to reboot your system following the operation. If you booted into Safe Mode to run the rootkit remover, reboot your system into Normal Mode.

Preventative Measures

Although rootkits act differently than most of the malware in the wild, the steps you take to prevent them from taking root are not unique. Avoid rootkits, and all malware types, by shunning unknown websites, refraining from clicking hyperlinks in emails, and by running up-to-date antivirus software. It also helps to have additional anti-malware utilities installed with which you can scan your system periodically. Make sure your firewall is currently enabled, and don't forget to install and update your OS *and* your software: Vulnerabilities in third-party software are common points of entry for rootkits. In the end, the best way to avoid an unwanted rootkit infection is to use common sense when surfing. ●

Meet Process Explorer

Manage The Open Tasks On Your PC



Name	PID	Private Bytes	Working Set	Description	Company Name	Path
explorer.exe	1,54	72,740 K	59,064 K	3672 Windows Explorer	Microsoft Corporation	USERS\nathan-lake C:\Windows\explor... 6.1.7600.16450
Apoint.exe	< 0.01	3,224 K	1,132 K	820 Alps Pointing-device Driver	Alps Electric Co., Ltd.	USERS\nathan-lake C:\Program Files\... 7.3.101.52
ApMsgFwd.exe	0.06	2,560 K	520 K	484 ApMsgFwd	Alps Electric Co., Ltd.	USERS\nathan-lake C:\Program Files\... 7.0.0.30
hidfind.exe		1,896 K	596 K	2592 Alps Pointing-device Driver	Alps Electric Co., Ltd.	USERS\nathan-lake C:\Program Files\... 7.0.0.29
igbttray.exe		2,972 K	416 K	4048 igbtTray Module	Intel Corporation	USERS\nathan-lake C:\Windows\Syste... 7.15.10.2104
hkcmd.exe		3,540 K	668 K	4052 hkcmd Module	Intel Corporation	USERS\nathan-lake C:\Windows\Syste... 7.15.10.2104
igtxpers.exe		2,692 K	2,300 K	4060 persistence Module	Intel Corporation	USERS\nathan-lake C:\Windows\Syste... 7.15.10.2104
stray64.exe		7,368 K	1,012 K	4044 IDT PC Audio	IDT, Inc.	USERS\nathan-lake C:\Program Files\... 1.0.6274.0
itype.exe	0.14	7,644 K	3,068 K	3812 IType.exe	Microsoft Corporation	USERS\nathan-lake C:\Program Files\... 8.15.406.0
ipoint.exe	0.22	6,760 K	3,188 K	2004 IPoint.exe	Microsoft Corporation	USERS\nathan-lake C:\Program Files\... 8.15.406.0
TdmNotify.exe		2,368 K	488 K	2380 TdmNotify Module	Wave Systems Corp.	USERS\nathan-lake C:\Program Files\... 3.3.0.396
OUTLOOK.EXE	0.11	390,696 K	425,596 K	2732 Microsoft Outlook	Microsoft Corporation	USERS\nathan-lake C:\Program Files (... 14.0.6117.5001
WINWORD.EXE	< 0.01	63,516 K	107,436 K	5720 Microsoft Word	Microsoft Corporation	USERS\nathan-lake C:\Program Files (... 14.0.5123.5000
splwow64.exe		1,708 K	2,672 K	3788 Print driver host for 32bit appli...	Microsoft Corporation	USERS\nathan-lake C:\Windows\splwo... 6.1.7600.16385
iexplore.exe	0.01	16,528 K	42,388 K	1476 Internet Explorer	Microsoft Corporation	USERS\nathan-lake C:\Program Files (... 9.0.8112.16457
iexplore.exe	0.13	174,732 K	249,532 K	784 Internet Explorer	Microsoft Corporation	USERS\nathan-lake C:\Program Files (... 9.0.8112.16457
iexplore.exe	0.22	131,172 K	145,020 K	2836 Internet Explorer	Microsoft Corporation	USERS\nathan-lake C:\Program Files (... 9.0.8112.16457
procexp.exe		2,488 K	872 K	4128 Sysinternals Process Explorer	Sysinternals - www.sysinter...	USERS\nathan-lake C:\Users\nathan-la... 15.30.0.0
procexp64.exe	1.24	45,832 K	26,524 K	5700 Sysinternals Process Explorer	Sysinternals - www.sysinter...	USERS\nathan-lake C:\Users\nathan-la... 15.30.0.0
SnippingTool.exe	0.16	4,436 K	26,576 K	2920 Snipping Tool	Microsoft Corporation	USERS\nathan-lake C:\Windows\Syste... 6.1.7600.16385

Process Explorer offers a hierarchal breakdown of open applications, so it's easier to make sense of the programs running on your computer and thus to control the resources they use.

The Task Manager built into Windows is the utility many of us use to find and eliminate active applications on our PCs, especially when things go wrong and we need to close a program. But there are a number of instances where Task Manager just doesn't provide you with the information you need to find and stop a given application. For example, the Descriptions section in the Processes tab often doesn't provide us with useful information about what an application actually does. For instance, we recently had a running process titled "hkcmd.exe" with the description of "hkcmd Mod-

ule." What to make of that? Microsoft offers a Process Explorer utility on its Technet website that provides many advanced features to help you understand and manage the programs running on your PC.

Downloading Process Explorer

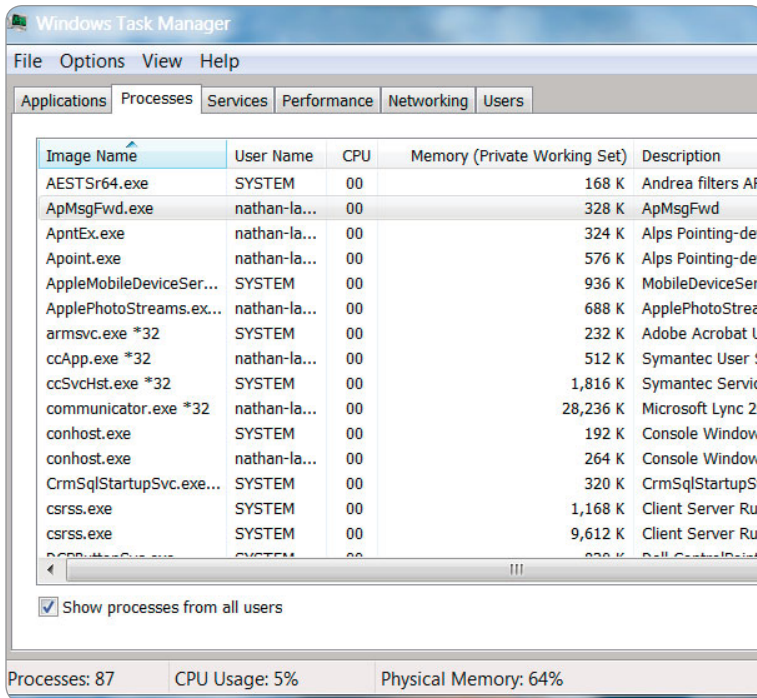
The easiest way to download the utility is to visit the Microsoft Technet site (<http://technet.microsoft.com>) and type **Process Explorer** into the search field. Select the link titled Process Explorer – Microsoft TechNet Home Page. Then, click the Download Process Explorer link near the

top of the page. The application downloads as a .ZIP file that includes a procexp.exe file that you can copy to anywhere on your PC. The self-contained executable file can even be copied over to a flash drive, so you can easily run it on someone else's computer. To run the program, just double-click Process Explorer (procexp.exe).

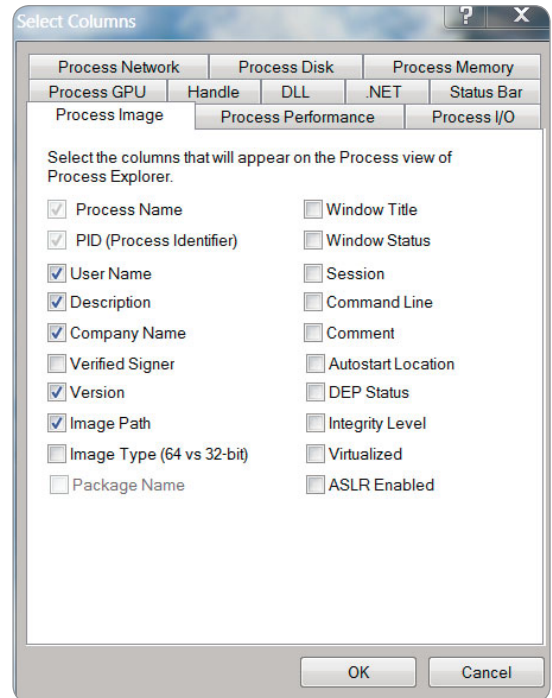
The Process Explorer Breakdown

When using the Process Explorer utility, everything is broken down within a hierarchy of related items. When one item, such as Internet Explorer, launches a window, such

Let's say that Internet Explorer is bogged down with 20 pop-up windows. You could simply select the top hierarchal Internet Explorer option, right click it, and select Kill Process Tree to close all the windows.



As you can see, Task Manager doesn't provide nearly as much detail as you'll find in Process Explorer.



It's a good idea to add the User Name and Image Path columns in Process Explorer for easy info gathering.

as a pop-up ad, you'll be able to view all of the items running under the process. In Task Manager, each individual process shows up in one long list, so you have no idea which one is the master process. Similar to Task Manager, you have the ability to end applications that are having trouble, but you can end a complete group of processes—rather than just one at a time. Let's say that Internet Explorer is bogged down with 20 pop-up windows. You could simply select the top hierarchical Internet Explorer option, right click it, and select Kill Process Tree to close all the windows.

The various items listed in Process Explorer each display the icon that you'd see on a Windows' Desktop, so may be able to distinguish the application even without referencing the description on the right side. We also like that the various processes are color-coded to make it easy to

determine which ones were started by you (a light blue color, by default settings), and which ones Windows starts on its own (a light pink color, by default settings). This way, you can avoid selecting Window services that could cause issues when shutdown. One of the best ways to see how a program was started is to add the User Name and Image Path category to the Process Explorer columns. You can do so by selecting the View menu, clicking Select Columns, and adding a checkmark to the User Name and Image Path checkboxes. This way, you'll see which

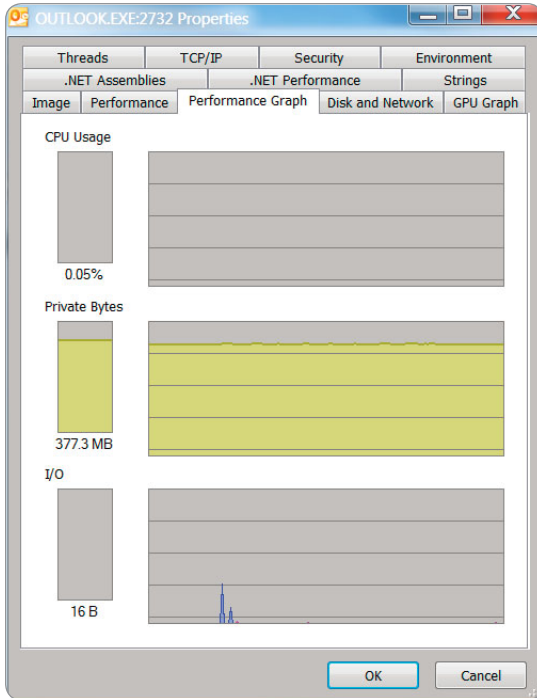
user opened the application and the file path for the process.

Resource Usage Data

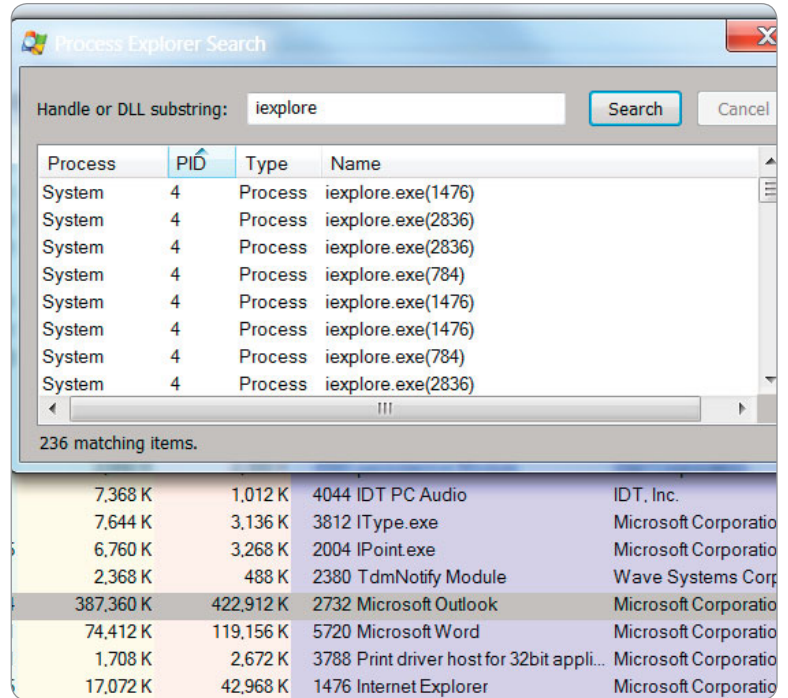
You can double-click an item to see more information about CPU usage percentage, memory performance, network activity, storage transfer rates, and the GPU usage percentage an individual program uses. The main window also displays a CPU usage percentage tab where you can see in real-time which services and applications are using up the processing power on your computer. This is a good idea for those who find their

Google A Process

Confused about what a given item in the Process Explorer does? Just right-click it and choose Search Online. This will bring up a Web browser that provides a search query regarding the process.



Select the Properties of an application to see information about the CPU usage and other resources it's been using.



You can search for a term with Process Explorer to see which applications are using a specific process.

PCs are bogged down and want to discover the culprit. You can see resource usage data for multiple components by selecting the View menu and clicking System Information—while still within an item's Properties page.

File Info

Select the Image tab on an item's Properties page, and you'll be able to see where the files for a given process are stored. This is particularly handy if you believe that there's a virus hiding on your computer and you want to root out where the malware is keeping its files. For example, let's say that your PC still seems

to be displaying signs of a virus, even after you've removed some viruses using the security software on your PC. You can use Process Explorer to look for questionable processes and discover files that may have been hidden by a virus.

You can also use the Process Explorer tool to unlock files. This feature is useful when Windows indicates that a file is in use, preventing it from being moved or deleted. Generally, Windows will lock a file during transfer, or if an application is currently using it. But in some cases, the file will continue to be locked down, even after you have closed the application using the file. To help unlock

files, Process Explorer can use the Find feature to determine which program or process is causing the file to be locked. Click the Find menu and select Find A Handle Or DLL. Then, search for the name of the file or folder in question. If you still wish to remove the lock, right-click the process and select Close Handle.

We recommend that you give Process Explorer a try, and see if you like using it better than the Task Manager utility built into Windows. If so, you can choose to swap Task Manager with Process Explorer. Just open Process Manager, click Options, and select Replace Task Manager. ●

You can use Process Explorer to look for questionable processes and discover files that may have been hidden by a virus.

Maintenance Basics

Fill Your Maintenance Toolbox



There's no one software or hardware tool that can take care of all of the maintenance you need to perform on your PC. In this article, we cover key things you'll need, so you'll be able to gather the necessary software and tools to fix up your computer.

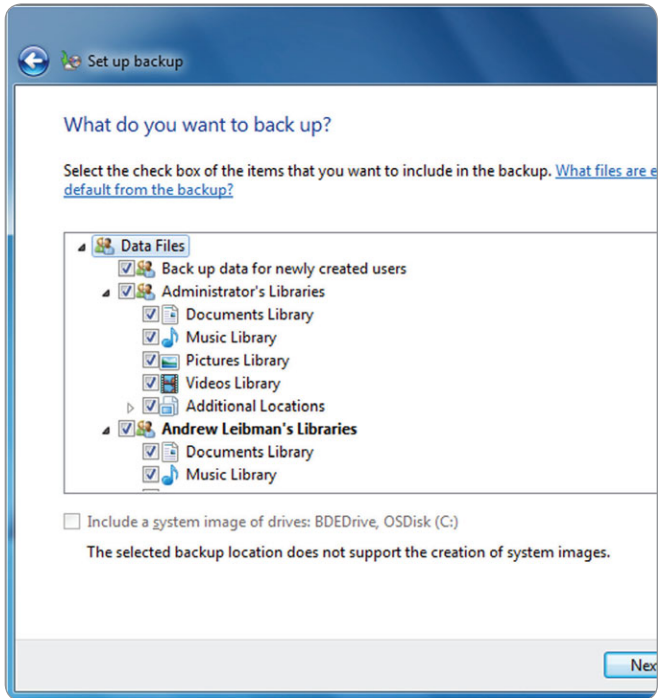
System Utility Software

This is a category of software that's designed to help do things like de-

clutter computer storage, remove files that are no longer useful, and keep drivers up-to-date. Typically, system utility software is bundled into a suite that offers a single, convenient interface for running the utilities.

Nearly all system utility suites include a disk defragmenter, which aligns scattered file fragments stored on a hard drive into continuous blocks to speed up file loads from the drive. Most system suites also

feature a Registry cleaner that looks for errors in the Windows Registry. Another common system utility is a drive-cleaning tool that examines your PC to find any unneeded temporary and orphaned files that have accumulated, which helps to free up space. Some system utility suites also include a driver update tool that compiles a list of drivers on your computer and sends you an alert when a new driver is available.



The most effective backup is one that you can schedule to run at regular intervals.



Some recommend using a non-magnetic screwdriver to ensure that you won't hurt the magnetic components in your PC. Use a microfiber cloth to clean dust off your monitor and other items that could be easily scratched.

Backup Service

Data backup is one of the PC tasks that everyone should do, but often doesn't. Most operating systems come with some form of backup capability. If the backup utility you're using lets you schedule backups, then set up that feature, making sure to back up after hours to keep the performance impact to a minimum. If only manual backups are supported with your utility, then you'll need a system in place to remind you to perform regular backups. Another option is to subscribe to a cloud-based

backup service capable of backing up both your system's data files and operating system. These send your backups to secure data centers, so you'll still have your data if a hard drive crashes or if the PC is stolen.

Physical Tools

Of course, not all computer maintenance can be done via software. To perform maintenance on the inside of your PC, you'll want a screwdriver. (Some recommend using only demagnetized screwdrivers, but in our experience, modern PC equipment is not nearly as suscep-

tible to small amounts of magnetism as those finicky floppies of yore.) Static electricity is a real concern, though; you can prevent shock-induced component failures by investing in an anti-static wrist strap. Plastic zip ties are another handy item, because you can use them to bundle cables together and keep them clear of fans.

Dust & Dirt Removal

The internal fans that keep your PC cool also bring dust, and your external peripherals, such as your keyboard and monitor, will also accumulate dust over time. To clean off the electronics, invest in some canned air and use it to periodically blow the dust out of the system. Another wise purchase is a monitor-cleaning spray and microfiber cloth for cleaning your monitor, because you want to avoid wiping any electronic device down with water or with a cloth that could scratch the screen. ●

Flash Drive Tools

With the help free utilities such as PortableApps, you can download portable versions of software that can run on a USB flash drive, so you can take them with you everywhere you go. Thus, it's a good idea to download to a flash drive some of the types of software we discussed in the main article for use when fixing PCs on the go.

What To Do When...

You Lose Wi-Fi Connectivity

Your Wi-Fi connection has proven a boon for both work and play: You can locate your computer pretty much anywhere in your home or office and still have a solid connection to the Internet, which means that you can surf the Web, send and receive email, connect to the office server via a VPN (sometimes even from your back deck or porch—how cool is that?), and much more. But what do you do when your connection suddenly . . . well, disconnects?

When In Doubt, Reboot

If your connection is suddenly dropped, it may be time to reboot your router and modem. (You reboot your PC often, but when was the last time you rebooted your modem and router?) Shut all three down, wait a minute or two, and then restart them in this order: modem first, then router, then computer. If that resolves the problem, then you're good to go—unless it reoccurs, in which case, read on.

Who's In Charge Here?

When you purchase a Wi-Fi card, it often comes with software you can use to configure and manage your wireless connection. But Windows has its own built-in software that does essentially the same thing. Use either one—but not both. The exact technique will vary, but select one or the other by right-clicking your wireless network icon, selecting the Wireless Networks tab, and then



checking (or unchecking) the Enable Windows Management (or similarly-named) checkbox.

Interference

If your Wi-Fi worked fine until today, ask yourself what might have changed recently. Any construction in your home or office? A remodel may have literally thrown up a wall (or other such obstruction) between your system and your Wi-Fi router. Have any new devices been installed near-

by? Telephones, baby monitors, microwaves, etc. in use? Those can all interfere with your wireless signal.

Up-To-Date?

Finally, consider updating the your router's firmware. Such updates often resolve bugs, add features, and generally improve the behavior of your device. Check the manufacturer's website to gain access to the latest drivers, utilities, and firmware for your router. ●

Lenovo recommends Windows 8.

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